Engineering Library

AMERICAN ARTISAN and Hardware Record

VOL. 84. No. 10. 620 SOUTH MICHIGAN AVENUE, CHICAGO, SEPTEMBER 2, 1922. $2.00 Per Year.

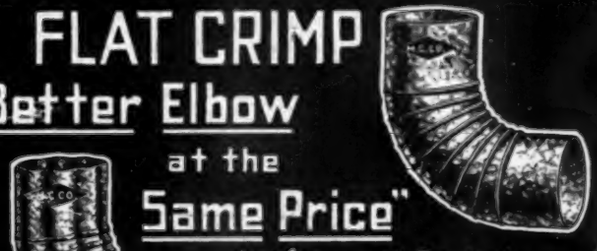
"Have a Heart"

—"Don't furnish inferior Conductor Pipe Elbows when you can supply

"MILCOR"

FLAT CRIMP

A Better Elbow at the Same Price"



Uniform and Perfect Corrugations
Galvanized after formed
Smooth, handsome, durable.—
Complete shipments in record time.

MILWAUKEE CORRUGATING CO.

Branch at Kansas City, Mo.

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Minneapolis Office, Lumber Exchange

Largest Manufacturers of Eave Trough, Conductor Pipe and Trimmings in the U. S.

The COPPER-CLAD

The World's Greatest Range

LINED WITH PURE COPPER
WHERE OTHER RANGES RUST OUT

With Porcelain Enamel Trimmings

The Copper-Clad Crank

COPPER-CLAD MALLEABLE RANGE CO.

ST. LOUIS, U.S.A.

Founded 1880 by Daniel Stern

Thoroughly Covers the Hardware, Stove, Sheet Metal, and Warm Air Heating and Ventilating Interests

AMERICAN ARTISAN and Hardware Record

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SOMETHING ABOUT POTATOES AND RANGES

In Greenberg's article on page 41 of this week's issue, he discusses the potato peddler and draws some very excellent lessons which may well be taken to heart by every business man.

There is one point in that story which Mr. Greenberg did not discuss, although the lesson which may be drawn from it is a very important one:

The peddler came to the door of Bill Johnson's house, inquired if Mrs. Johnson needed potatoes, found that she did—

Showed her how nice his potatoes looked—

Named his price—

And made a sale.

The average retail hardware merchant looks down upon the peddler.

And yet—this same peddler, whom we despise and dislike so much, is doing something which since the earliest days of merchandising has been fundamental in building business success:

The peddler buys a stock of merchandise.

It may be garden truck, notions, housekeeping utensils, dry goods, hardware, groceries, washing machines, stoves—

Any one line of these, or a combination of two or more.

Then he loads it into his wagon or automobile truck and goes a-hunting for customers.

He may have a regular territory which he covers by section at regular intervals.

Or he may be a rover, seldom striking the same community more than once.

The point is that he is continually seeking out people who may be induced to buy what he has in stock.

That is where he stands superior to a very large percentage of those who would like to be called retail merchants.

He seeks trade—seeks it by real, personal work—while the would-be merchant sits in his store and waits for trade to seek him out.

That is why, for example, the stove peddler finds it not only possible, but profitable to sell kitchen ranges in June, July and August—every month in the year.

He comes into town with a carload of ranges.

Does he sit down in the hotel or at the freight station and wait for people to come in and tell him that they want to buy a range?

Not so you can notice it.

He drives into the country and gives it a thorough canvass, and within a reasonably short time he has the carload sold and delivered—

While the stove dealer in that town tells his banker that he cannot turn his stock into cash and must borrow money to pay his bills to the manufacturer who sold him his stock of ranges.

It may not be dignified to "peddle" but a real merchant does not hesitate when it is a question of hurting his so-called dignity or missing sales.

He goes out and locates people who by real salesmanship can be induced to buy his ranges.

Random Notes and Sketches.

By Sidney Arnold

I have never had any use for the salesman who uses derogatory statements about other competing lines in his attempt to sell his own. He may be right in all or most of what he says about the other lines, but if he were really "sold" on his own and believed thoroughly in what he is selling, it seems to me that he could find some other way of emphasizing the good points of his line.

This idea is brought out in the following statement by the makers of the Linograph, a typesetting and casting machine:

Linograph salesmen do not find it necessary to slander or "knock" competing machines. They recognize the fact that the customer who buys a machine of another make has that privilege. Their mission is only to reach him before the order has been placed so that they can tell him about the special features of the Linograph before he buys.

In advertising the Linograph it is never the intention to cast reflection on other machines. It is a well known fact that each make has some special mechanical details which appeal to some and not to others.

All that Linographs advertising is expected to accomplish is to arouse a desire in the prospective purchaser's mind for more detailed information and a thorough investigation before purchase. If this is accomplished we shall feel that the decision can safely be left to the purchaser.

It is a source of regret to us that we frequently find evidence of base slander spread by salesmen representing our competitors, in which they have made false statements about the Linograph, which indicate that they have never seen a Linograph and that they at least have never taken the trouble to find out what the facts are.

These are medieval methods and there is but one reason for their use—the salesman who "knocks" is afraid he can't convince his prospect and sell his goods on merit alone.

Very frequently we have found that those who expressed adverse opinions about the Linograph had never operated one and often had never even seen one in operation, and that what they knew about it had a very indefinite source.

Just remember this: When a salesman resorts to misrepresentation or slander about the Linograph, it is because he fears the prospect is favorably inclined toward it; he is afraid he can't overcome this tendency by expounding the merits of his own goods, or by clean salesmanship, and so he resorts to slander. That naturally suggests the advisability of making a thorough investigation before purchasing. We will be glad to help you find out what the facts are.

* * *

Julius Gerock, who makes statues and structural ornaments of sheet metal in St. Louis and sells them all over the United States, tells this story about a Texas town:

While passing through Van Horn, Texas, "Jule" strayed into the lobby of the one and only hotel in town. On one side was a blackboard setting forth the advantages of the place, and making up in enthusiasm what it lacked in modesty. Van Horn was the county seat, the center of various mining industries, its climate was second to none, and finally as a climax came this sentence:

"We Had to Kill a Man to Start a Cemetery."

* * *

Robert J. Fulton, sales manager for the Hoosier Stove Company, was in to see me the other day and told me this story:

A justice of the peace, whose home is in Indiana but whose farm runs along the Ohio State line, was oppressively imbued with a sense of his own responsibility, and never lost a chance to show his authority.

One day a fist fight arose between his son and the hired man. The justice, quick to see the situation, climbed on the borderline fence as a better bench of justice and commanded "peace in the name of the State of Indiana." No sooner, however, had he delivered this order than he fell over backward and went sprawling into Ohio. Lying prone on the ground, he bellowed to his son:

"Give him the devil, Bill, give him the devil! I've lost my jurisdiction!"

* * *

Charlie Gohman who makes and sells a lot of Pointer (Dog-on) kitchen ranges, lives down in a section of Indiana where they still have some of the real old time "colored folk," and here is a story he heard and forwarded to me:

The benevolent old gentleman paused to ask the trouble of a forlorn looking old Negro who sat on the village curb.

"As a rule, suh," commented the dusky patriarch with dignity, "as a rule, dey's allus days when a married man is li'ble to be down in de mouf."

"Tut, tut," said the gentleman, "remember, my good man, there are exceptions to all rules."

"Yassuh—but yo' see, suh, I'se done married to one of dem 'ceptions."

* * *

Bridge of Yesterday.

Over the bridge of yesterday
My thoughts have turned tonight,
And out of the far-off distance
Comes a tender, glowing light.

It centers around a friendship
That has lasted through time and tide,
Though the chance and change of fortune
Has severed our pathways wide.

It may be that earth's tomorrows
Hold for us no meeting place;
It may be that only in heaven
I shall meet you face to face.

But when memory seeks a pleasant trip,
And the choice of a pathway comes,
I choose the bridge of yesterday
To the days when we were chums.

How to Make Best Possible Use of Booklets and Other Selling Helps Furnished by Manufacturers.

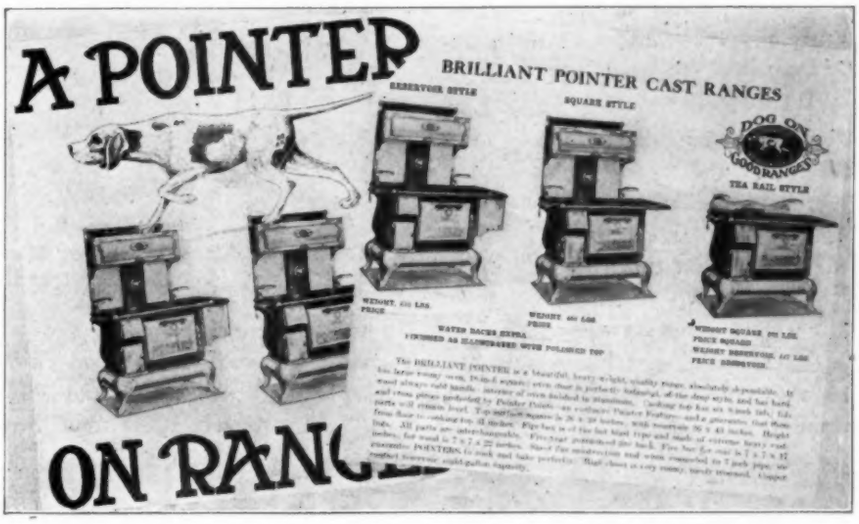
Distribute Them by Mail or in Person and Reap Real Tangible Results in Shape of Actual Sales.

IT IS safe to say that when booklets illustrating and describing in detail the merchandise the retail hardware dealer was carrying in stock, were first made use of by the manufacturers to help stimulate the retail sale of their products, by far the greater portion was not utilized by the retailer in the most effective manner.

The writer has visited stores where waste baskets, empty bins below the counters, drawers, etc., were filled to overflowing with pamphlets, folders, posters, window cut-outs, etc., all prepared and furnished to the retailer at great expense by the manufacturers from whom he bought his stock.

All of this expensive material, which could have been extremely helpful to the retailer if he had been willing to make use of it, was allowed to gather dust in the repositories for a longer or shorter period and finally found its way to the pile where the rubbish from the store was disposed of by fire.

Let us suppose that after the sale was completed and the stove manufacturer's salesman had written up the order for, say, twelve kitchen ranges and received the merchant's O. K. on same, the salesman says:



Gohmann Brothers & Kahler, New Albany, Indiana, Make Only One Size of One Type of Cast Ranges, But in Several Finishes. These Pages Show Their Brilliant Pointers.

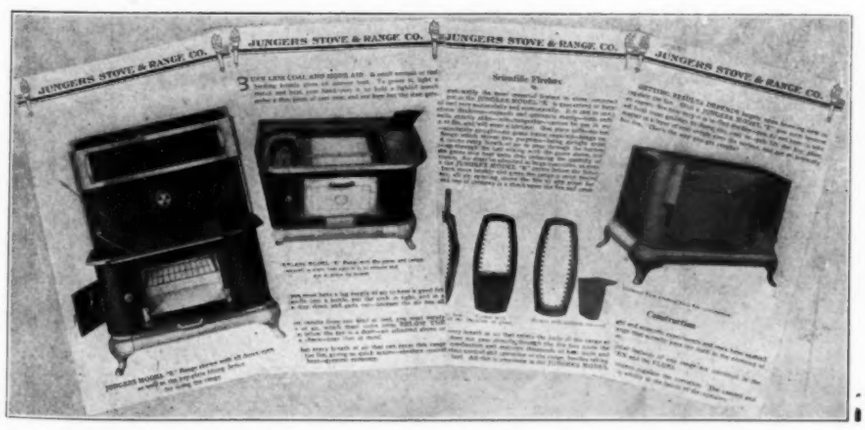
"Now, Mr. Jones, you know I told you that we would help you in every way possible to sell these twelve ranges. I also told you that we had some very fine descriptive booklets, beautifully illustrated and printed in effective colors on fine paper, and that we would furnish a quantity to you for distribution to your people—how many do you want of them?

Mr. Jones really had not been very much impressed with that angle of the introductory selling talk, but when the salesman mentioned the matter again, he gave the offhand reply, "Oh, send me four or five hundred, and also some posters and streamers for my windows."

The salesman makes a notation on the order blank to that effect and when the shipment is made, the booklets, posters and streamers are included.

The shipment arrives, the ranges are removed from their crating, set up and polished after which they are arranged in a row on the sales floor. The booklets, etc., may or may not be noticed particularly. They may be put on a shelf, under the counter, a few being placed on top of the counter, where the customer may or may not pick one of them up and glance idly through it while waiting for his change on the pound of nails that he bought.

Maybe the so-called salesman will notice that the customer is looking at the booklet, and maybe he will ask him if he is "interested in a new range," but chances are that the incident will pass by without any attention being paid to it by



Four Pages of Booklet Describing and Illustrating the Novel Design in Kitchen Ranges Manufactured by the Jungers Stove & Range Company, Grafton, Wisconsin.

the so-called salesman, and an opportunity for finding out whether the customer really was interested is lost.

Now, the reason for this failure is to be found in the fact that the manufacturer's salesman did not "sell" these selling helps to the merchant. He failed to realize that by his lack of attention he lost an opportunity to increase his sales to that merchant, for it is as sure as death and taxes that if he had really "sold" the selling helps to the merchant, the latter would have sold one or more ranges in addition to the twelve that he ordered, instead of having two or three of them left when the season was over.

All right then, what should the manufacturer's salesman have done?

The Hoosier Stove Company, Marion, Indiana, Publishes Several Interesting Booklets for Distribution by Their Merchants.

He should have said something like this:

"You know, Mr. Jones, that we furnish these fine booklets to you, without any charge, and we do this because we have found out that when they are used properly they always help to create additional business for those who use them in that way.

"There is William Smith over here in Grundy City, whom you no doubt know. He has a store very much like yours, doing business with very much the same sort of folk as you have here.

"We started him out with an original order for six ranges and sent him two hundred booklets with the understanding that he was to mail them out to people whom he thought might be in the market for a range. He did so and the first season he sold eight—two more than he had thought he could sell.

"Today he sells more than thirty ranges in the fall and winter season and about fifteen in the spring and summer—forty-nine ranges was his record for last year!

REMEMBER!
SEND US THE NAME
WE HELP YOU SELL 'EM
You Give Good Advice When You Run This Ad—
have no regrets
When you buy your range-Buy a Copper-Clad
ALL IN THE STATE OF MIND

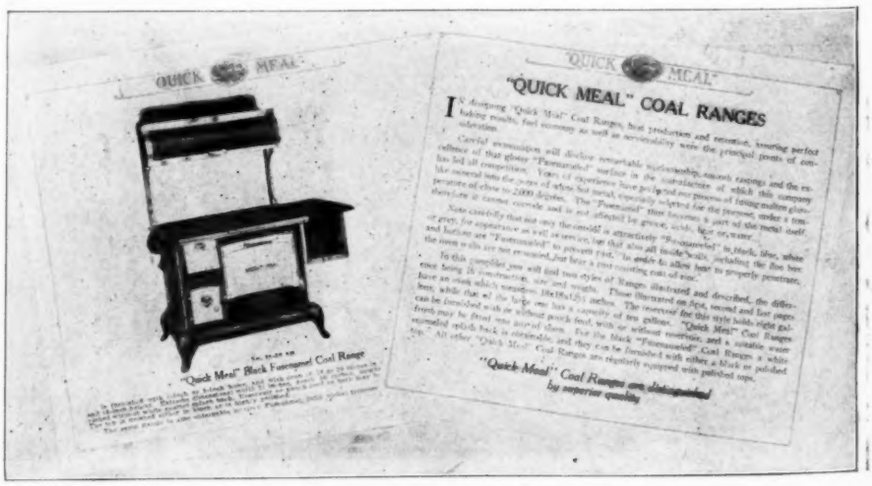
Pages From One of the Fine Selling Helps Published by the Copper-Clad Malleable Range Company, Saint Louis, Missouri, Showing One of Their Ready-to-Use Advertisements.

"And I could tell you about many others who have had the same experience, but you do not need that sort of information. You can readily see that if these booklets get into the hands of people who need a new range they will make the job of selling them one much easier.

"Now, these booklets cost us a good deal of money, so we want to have them used where they will do the very most good, and to accomplish this you have to do your share.

"If you want five hundred of these booklets, they will be sent to you—gladly—but we do not want to send them unless you will make real use of them, send them to live prospects, and follow these prospects up. Is that understood?"

By a talk on this order, the retailer will have it brought to him in a perfectly plain and yet absolutely



Two Interesting Pages From Booklet Printed in Colors Furnished to Dealers by the Quick Meal Stove Company Division of the American Stove Company, Saint Louis, Missouri.

The Independent Stove Company, Owosso, Michigan, Furnishes Many Helpful Booklets for Their Dealers' Use on Prospects. Four Good Looking and Interesting Pages From One of These Booklets.

inoffensive manner that by accepting the booklets he thereby obligates himself to use them in a really effective way—and if he does so use them, he will sell more ranges than he has ever done with the same investment.

All right then. The booklets come in along with the ranges.

Mr. Jones, the stove merchant, has them placed in his office and from his mailing list he selects a number of names to which they are sent with a short note, telling the prospect that a new shipment of the ranges has just been received and possibly a post card asking him if he would like to have someone from the store call and explain in full detail the excellent features of the range, but at any rate, an invitation is extended to the prospect to come in and look at the new ranges.

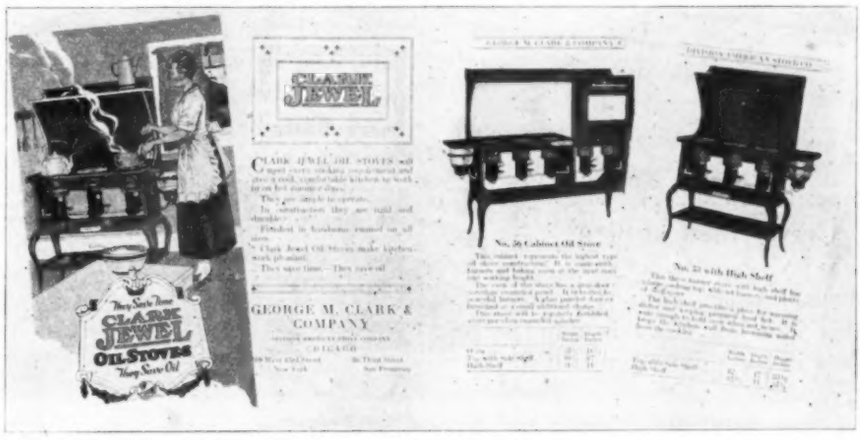
That is making the best possible use of the booklets.

Others make it a practice to use them as envelope "stuffers" when statements are sent, and some good comes from this use.

Still others follow the custom of wrapping one or more booklets describing various lines of merchandise in packages, but the trouble with this method is that only those who are already customers have the ranges brought to their attention, and although sales may result, new trade is not created.

Then there is the "peddling" of booklets by means of throwing them into buggies or automobiles on market days. That is almost an absolute waste. Most people object to having their vehicles cluttered up with them, and instead of creating interest, this practice usually creates ill will.

There is also the case of the stove dealer who sends a boy around to the houses in town and has him stick a booklet or two in the mail box or under the door. People do not as a rule like to have their mail boxes filled with that sort of "mail." Another case of ill will instead of interest.

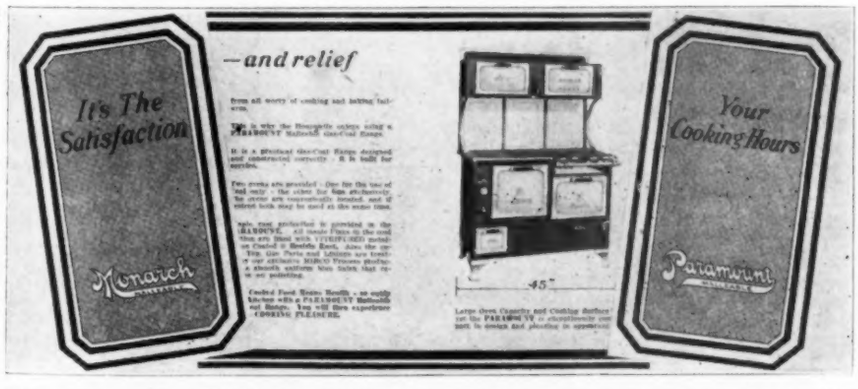


Front Cover and Three Inside Pages of Excellent Selling Help Booklet on Clark Jewel Oil Stoves. Published by the George M. Clark & Company Division of the American Stove Company, Chicago.

Finally we have the retailer who puts a pile of the booklets on the counter, and we have already seen how little effect that has on the sales.

Judging from the experience of the most successful merchants, the mailing method, using a carefully selected list of prospects, is the only really effective way of using the booklet, folder or other selling helps of similar nature.

There are shown in this article reproductions of pages selected from booklets furnished by various stove and range manufacturers, all of which can be used to good advantage by the retail merchants who carry these lines in stock.



Pages From Two Booklets Published for Dealer Co-operation by the Malleable Iron Range Company, Beaver Dam, Wisconsin. Note the Appeal to Women on the Covers.

Benjamin Franklin Is Patron Saint of American Stove Manufacturers.

Nearly One Hundred and Eighty Years Ago Benjamin Franklin Invented the First Successful Portable Stove.

IT IS not generally known that Benjamin Franklin, the illustrious statesman of Revolutionary times, was the inventor of the first successful portable heating stove. but it is a fact, nevertheless that in 1742, he did manufacture a heating apparatus, such as the one shown in the accompanying halftone illustration.

Benjamin Franklin.

One of the first of these stoves was presented to his friend, the famous master, Thomas Paine, and this identical stove is now to be seen in the former home of the latter, which is kept up as a memorial in New Rochelle, New York, by the Huguenot Society of American of which Thomas Paine was a prominent member.

Instead of bolts and nuts being used this "Franklin Stove" was fitted together with grooves. like some of the later types which are now on exhibition in the offices of AMERICAN ARTISAN AND HARDWARE RECORD, and reproductions of which are shown on another page.

Franklin died in 1790, and in memory of his death, the "Magic Chef," the excellent house organ of the American Stove Company, published the following article to which we are glad to give further publicity:

One hundred and thirty-two years ago, this month, there passed on to his reward, the inventor of the first American stove, and patron saint of all stove men. It is fitting that we of the stove industry should here recall his achievements and pay homage to his memory.

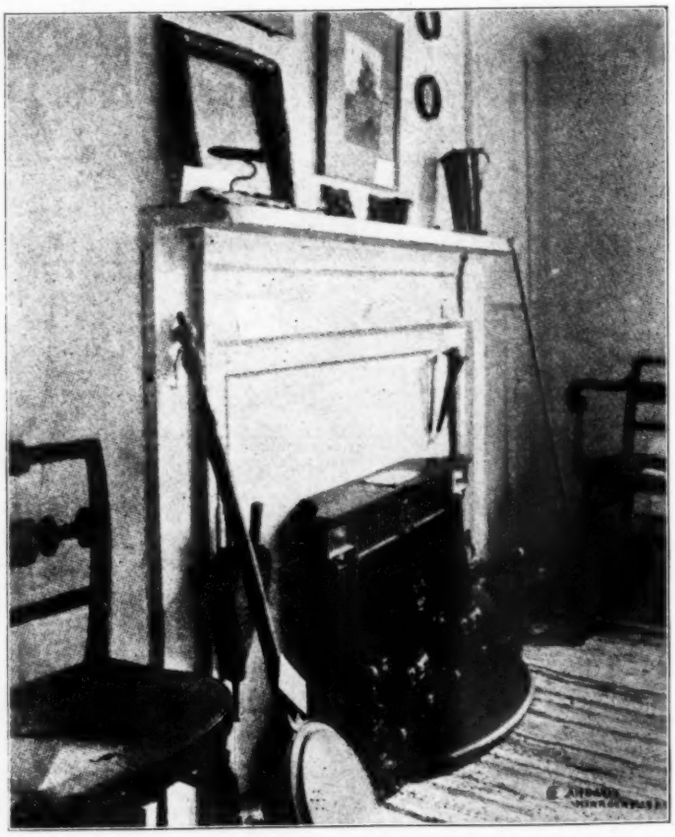
Because publicity has been centered chiefly on his other accomplishments, Ben Franklin is not generally remembered as the inventor of a stove upon the fundamental principle of which are built the finest ranges of today. Yet an article in the Gas Light Journal a few years ago said: "Franklin's fireplace was in reality a portable stove, based on the principle of passing air through flues, thus heating the surrounding air. And modern American stoves, whether for wood, coal, or gas, are based on its design."

This article stated that a stove manufacturer of the middle west had begun a movement to recognize Franklin as inventor of the forerunner of modern stoves, by starting a subscription to place a bronze tablet in the Franklin Institute at Philadelphia. But for some reason, the project was never carried out.

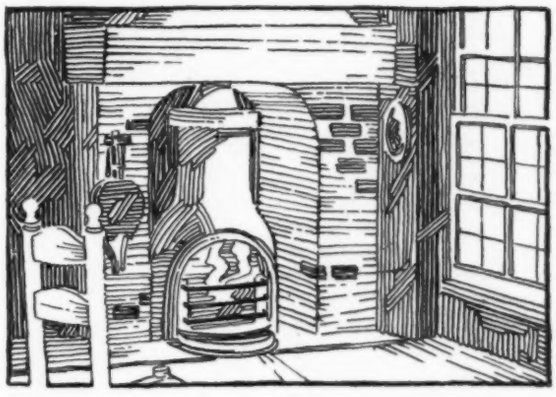
Franklin invented his stove because of cold feet. That is, he—like everyone else—suffered from the coldness of early Colonial houses. In those days, there were no means of heating except open fireplaces, which also served to cook the family meals.

We read accounts of vessels of water being frozen while in a room where a fire blazed merrily on the hearth! When one got close enough to the fireplace to feel the heat, he toasted on one side and froze on the other. Most of the heat went up the chimney.

Franklin tackled the problem—and in 1742 produced a stove which in an ingenious way conducted heat and smoke through flues before allowing it to enter the chimney. No one had thought of that before! By thus heating a large area of metal, the stove thoroughly warmed the air of the room. It



Original Franklin Stove, Made in 1742. Installed in Paine Memorial House, New Rochelle, New York.



was at once eagerly adopted by shivering New England.

Franklin in commendable public spirit, purposely never took out a patent on his stove, which is still used in this country and in Europe.

Himself a good example of his teachings, Franklin did more than any other American to stock the minds of people with ideas of thrift, perseverance, and industriousness.

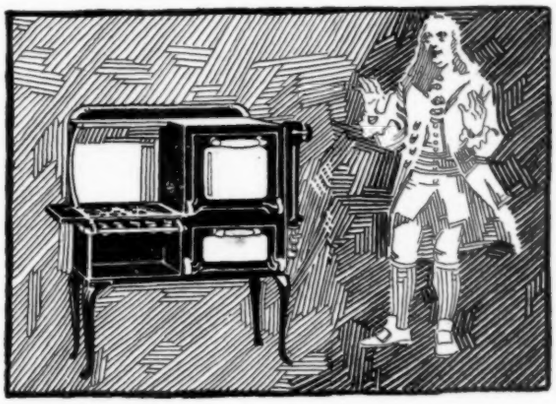
His famous "Poor Richard's Almanac," which he wrote and published for over a quarter of a century, was the most popular publication in America. Listen to these sayings of "Poor Richard":

"God helps those that help themselves." "There are no gains without pains." "Industry pays debts, while despair increaseth them." "Drive thy business—let not that drive thee!" "The eye of the master will do more work than his hands." "Keep thy shop, and thy shop will keep thee."

Franklin's philosophy was homely, but it was founded on bedrock. He knew. He was a successful business man himself.

Printer's apprentice, printer, journalist, newspaper publisher, merchant, advertiser, capable man of affairs, diplomat, statesman, ardent patriot and signer of the Declaration of Independence, author, scientist, inventor, a lover of life and all its pleasures—here's to rare Ben Franklin, a great man and an immortal American!

The illustrations, reproductions of pen drawings, are shown by the courtesy of the American Stove Company and indicates the progress in the stove industry, from the time of the fireplace to the modern gas range.



Southern Stove Manufacturers Meet at Signal Mountain.

The Southern Stove Manufacturers' Association held its summer meeting August 28th and 29th at Signal Mountain Inn., near Chattanooga, Tennessee.

The attendance was almost one hundred per cent of the membership and a number of visitors, representing manufacturers of supplies for the trade were also present.

As usual, the big feature of the gathering on Signal Mountain was a fine dinner and entertainment Monday evening.

Universal regret was expressed over the fact that Samuel H. Jacobs, Vice-president and General Salesmanager of the Fanner Manufacturing Company, was prevented from attending because of serious illness. Mr. Jacobs is now in a hospital in Cleveland preparing for a blood transfusion.

Klein Stove Company Will Sell Two Well-Known Refrigerators.

The Klein Stove Company, 60 North Second Street, Philadelphia, has secured the agency for the well-known Leonard Cleanable and Glacier Sanitary refrigerators.

The Company will carry a complete stock of both lines for the trade contiguous to Philadelphia.

Sill Stove Works Will Build Addition to Its Plant.

The Sill Stove Works, Incorporated, 524 Oak street, Rochester, New York, plans the erection of a one-story plant addition.

Birmingham Stove and Range Company Plans Additions

Plans have been drawn for an addition to the plant of the Birmingham Stove & Range Company, Birmingham, Alabama, which will add 50 men to the roll and will provide for the manufacture of gas stoves and ranges in the Birmingham district. This company is melting 12 tons of iron daily.

No man is so poor that he can't afford to smile occasionally.

These Are Types of Heating Stoves, Which Date Back to the Middle of the Eighteenth Century. The One in the Center of the Top Row and the Three in the Second Row Belong to the Class Named after Benjamin Franklin, Who Invented the First Portable Heating Stove in 1742. All of These Stoves Are on Display in the Offices of American Artisan and Hardware Record, 620 South Michigan Avenue, Chicago, Being Part of the Collection of the Late Daniel Stern. Who Founded This Publication in 1880

How Jones Sold a Good Kitchen Range to a Confirmed Mail Order Buyer.

Jones Knew His Range and Was Quick To Take Advantage of His Opportunity.

THE following incident was witnessed recently by a representative of AMERICAN ARTISAN in a little town in Southern Minnesota. It is related here in order that other stove merchants may benefit from the experience:

An old farmer entered Jones' hardware store and asked for a package of shells, for which he paid, and after having told the proprietor that there wasn't anything else he wanted he started toward the door

There was a double row of cooking stoves and ranges reaching almost through the entire store and one faced the entrance When the old fellow had reached this stove he stooped, opened the oven door and looked into the oven

Jones who had followed him asked if he was thinking of buying a stove.

"No," said the farmer, "I got one a couple of years ago; but 'the old woman' says it's no good. She says it won't bake."

"What is the matter with it?" asked Jones.

"The oven 'leaks'," said the farmer, "at least 'the woman' says that she can't keep it hot enough to bake bread without having the draft on all the time and if she does that it gets too hot and burns the bread."

"What kind of a stove did you buy? Where did you get it?"

"I got it in Chicago. How much is this one?"

"One hundred dollars. What did you pay for yours?"

"Fifty-nine-fifty. That is an awful price to pay for a stove."

"Never mind about that. Would you like to trade your old stove off if you could get a good deal?"

Jones realized here that he had made a mistake in naming the price on his stove before he had even gotten the farmer to the point of saying that he might buy a new stove, but he made the best of the situation and that was why he suggested the trade, which at once got the farmer interested.

Then he went ahead and made a very good selling demonstration of his stove, and it is interesting to note in this connection that he carried in stock only two makes—one a cheap cast iron, the other a malleable, but each in various sizes and styles—four and six holes, with or without warming cabinet and water reservoir.

He pointed out first that the fire box in his high grade stove came in four pieces which fitted each other perfectly and which made it possible to replace on of them if it should be damaged in any way. The fire box in the mail order stove was in one piece.

Taking the top off he showed that there was quite an air space between the outside of the fire box and the oven, and here was where he put in his strongest argument for his stove.

"This air space," said he, "heats the sides of the oven without bringing the sides into direct contact with the hot fire box. That was where the trouble came in with your stove. The side of your oven was right up against the fire box; that was what made the sheet iron 'warp.'

"Then note the thickness of our oven sides. To be sure, it takes a bit more time to heat the oven, but once it is hot it will keep the heat so much longer, and there is much less danger of the sides 'springing' the way yours did."

But all this time, the farmer seemed uneasy and thinking of something besides what Jones was telling him, and finally he let it out.

"That may all be so, but look at your price. It is nearly twice as much as my stove cost me all laid down here."

"Sure," said Jones, "that is a fact, but just figure this out: You paid about a third less for your stove, and it is useless now—two years after you bought it. You know Jim Smith, who owns the place on the corner just beyond you. He is in town today. You can easily find out what he thinks of my stove. He bought one six years ago.

By good luck, Jim Smith happened to pass by, and Jones called him in.

"How about it, Jim, what does Mrs. Smith think of that stove she bought from us?"

"Jim" was one of these pleasant individuals who hate to admit that anything a merchant sells them turns out absolutely satisfactory, so his reply was not just what Jones would have liked, but it gave him a chance to point out that Mrs. Smith had won a prize for the best batch of bread at the county fair the previous fall, so there couldn't be any doubt as to the baking qualities of the oven—and the stove had then seen six years' service.

Finally the farmer said that he would see what "the women" thought about it, and "maybe next time they came to town they would come in and look again."

"Oh, is Mrs. Jones in town? Why didn't you say so before? Where is she? I'll send one of the boys out and ask her to come over."

So Mrs. Jones was brought over, and it didn't take long for Jones to point out to her just where his stove was strong as compared with the one she had and didn't like.

And then, possibly the fact that Jim Smith was there, may have had something to do with the changed attitude of Jones, for after his wife had come into the store, it took less than half an hour for Jones to close the transaction and ring up the sale on his cash register.

After the customers had left, the representative of AMERICAN ARTISAN and Jones talked over the incident, and Jones admitted that he had made a mistake in naming his price so early, and that if it hadn't been for the lucky circumstance of Jim Smith passing by he would very likely have lost the sale.

Study and Interpretation of Advertisements.

You Can Make Your Advertisements More Gainful by Avoiding the Faults and Profiting by the Good Qualities of Others.

The month of September ought to be the best stove and range selling month in the entire year.

But in order to make it so, it is necessary, absolutely necessary—that the merchant make a real effort to induce the people in his community to come to his store to look at the stoves and ranges that he has for sale.

That means some form of advertising.

It may be by specially prepared letters, accompanied by such booklets, folders or other printed matter as the manufacturers from whom he buys furnish him.

It may be by newspaper advertisements in his local papers.

It may be by printed circulars, prepared by himself.

It may be by a combination of two or more of the methods mentioned.

The point is, that unless he makes a special effort, he will not sell as many stoves and ranges as he ought to sell and as he otherwise would sell.

We do not believe that it is good policy to advertise cut prices at this time.

If stoves and ranges can not be sold during the fall months at the full regular price, they certainly can not be sold on that basis at any other season.

It may be proper to offer discounts in January or February on coal ranges and heating stoves, but we can see no good reason for offering them at reduced prices now.

The two advertisements shown in the second illustration herewith are, therefore, not reproduced because they are typical of good advertisements at this time under ordinary circumstances.

They do contain, however, some meritorious features, such as, for instance, in the advertisement of M. A. Peabody, which appeared in the Decatur, Illinois, *Review*, where an unusual opportunity is presented to secure a used range in good condition at a low price.

Incidentally, we are quite certain that Mr. Peabody will sell a good many new coal ranges to those who come in to see those advertised.

In the other advertisement shown in the same cut, the Newport News Furniture Company, Newport News, offers in the *Herald* a 25 per cent discount on all coal and wood ranges, the reason being that this department is to be discontinued.

The time chosen for this announcement is very appropriate, and

WINTER
With all its shivers and chills will soon be here.
Are you prepared to combat high priced coal?
We are prepared again to furnish you as we have in the past 15 years
THE RETORT
Which will keep you comfortable through it all, with the least possible cost. Burns anything that is burnable, Holds fire for 60 hours and easi y controlled. A stove that combines
Cleanliness
Convenience
Durability
Economy of Fuel
Power
Steadiness of Operation
Appearance and Ease of Management
The successful soft coal magazine stove—Let us show you this wonder, which has over 500 users in Anderson and vicinity
DUFFEY'S NORTH SIDE HARDWARE

the advertisement should produce the desired results.

In the first advertisement reproduced, a heating stove is featured, and the fact that "it will burn anything which is burnable," is full of interest in view of the possible shortage of coal.

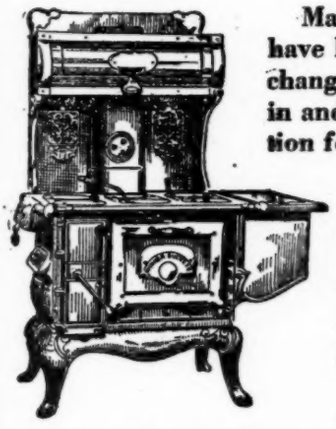
The important features of the heater are emphasized in an effective manner, and the fact that over 500 users are to be found in and near the city in which the advertiser does business should help in convincing prospective purchasers.

This advertisement was inserted in the *Bulletin*, by Duffy's North Side Hardware, Anderson, Indiana.

Though you may doubt it, some Hawaiian music is really better than it sounds.

You Can Save Money

—by selecting a good, slightly used stove or range that has been put in good repair and is guaranteed to be just as represented.



Many of these Stoves have been taken in exchange where gas was put in and are in fine condition for long service.

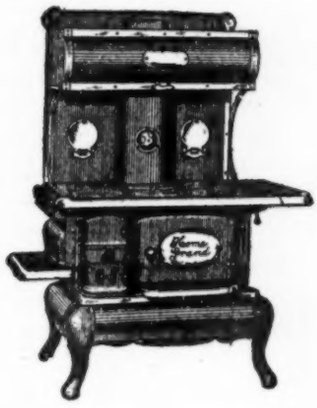
You may select your stove and we will hold it till you are ready for it, with no extra charges for storage.

In this way you save money and get your pick of a larger assortment than we will be able to show you later when everybody wants their stove.

We want you to see these stoves whether you buy or not.

M. A. PEABODY

121-9 E. North St.



25% Discount

All Wood and Coal Ranges

The most sensational stove news in years. Our entire line of Coal and Wood Ranges to be sold out and discontinued. For many years this stove department has been recognized as Newport News' headquarters for fine cooking stoves, and it is with some regret that we break loose from such old familiar names as Round Oak, Home Grand, Home Comfort and a few other well known makes.

Here they are—a wonderful selection—come and take your choice and take 25% from the prices marked. Terms of payment will be made easy for you.

This Home Grand Range

18-in. Oven, $43.88

Deduct 25% from the price of $58.50 and you have it—$43.88. Just like the picture above. This is only one example of what this offer means—it will pay you to investigate even though you may not actually need a stove until cold weather.

Newport News Furniture Co. INC.

3007 - 3009 WASHINGTON AVENUE

HAPPY HOME FURNISHERS

W. F. Habicht Will Re-Enter Matrimonial Field.

It is reported on good authority that W. F. Habicht, who is well known in Pennsylvania stove circles, being associated with the Klein Stove Company, Philadelphia, is to be married this Fall.

His many friends will join AMERICAN ARTISAN in wishing him the fullest measure of happiness

Events and Progress of the Hardware Trade.

What the Retailers, Jobbers and Manufacturers Are Doing. Latest Selling Methods and Experiences of Successful Men.

Wire Goods Manufacturers Form Million Dollar Corporation.

The Wire Goods Company, Worcester, Massachusetts, the Cassady-Fairbank Company, Chicago, and the Andrews Wire & Iron Company, Rockford, Illinois, and Watford, Canada, have consolidated as a $1,000,000 corporation with headquarters at 28 Union Street, Worcester. Several other concerns are involved, including the Ayres Manufacturing Company, Pawtucket, Rhode Island, and the Wood-Sherwood Company, Lowell, Massachusetts. The combination will operate under the firm name of the Washburn Company and will constitute one of the largest hardware combinations in the country. The Wire Goods Company was established in Worcester in 1880, while the Lowell, Massachusetts, concern is the oldest making kitchenware in the country.

The officers of the new company are: Charles G. Washburn, president; Arthur C. Andrews, Rockford, Illinois; Perry M. Shepard, Chicago, and William L. Walker, vice-presidents; Reginald Washburn, treasurer and general manager; Irving A. Green, secretary. The officers constitute the board of directors.

Here Are Some of the Most Important Factors That Go to Make a Good Hand Saw.

The Hardware Merchant Can Increase His Sales of Saws and Other Tools by Intelligent Advice and Proper Selection.

Written especially for AMERICAN ARTISAN AND HARDWARE RECORD.

A few days ago the writer had occasion to make a purchase at a retail hardware store located in a large middle-western city. Among other customers at the tool counter was a young man, apparently a mechanic, who asked for a dozen hack saw blades and without making any further inquiry as to the purpose for which they were intended the clerk immediately took from his stock shelves a dozen blades, wrapped them in paper, made out a sales slip and handed the package to the customer, who left the store. In subsequent conversation with the clerk the writer learned that the hack saw buyer was not a regular customer—that the clerk had no means of knowing where the blades were to be used, or what kind of material was to be cut.

This was poor salesmanship, and not calculating to bring about "repeat" business. But it is typical of the manner in which saws and edge tools are often sold. While the argument does not apply to the average skilled mechanic, the fact of the matter is that the average saw buyer knows little or nothing about the technical side of saw making, and usually depends for such information upon the store from which a purchase is made.

In the case in point, above quoted, the customer relied absolutely upon the clerk, and the latter should have inquired whether the blades were to be used for the cutting of brass, tool steel, aluminum, sheets, rail, etc., and then furnished saws of the right degree of hardness and temper; with the right number of teeth to the inch; of the right length, width and gauge and of the exact depth, and set of the teeth.

This information can readily be ascertained from the manufacturer and if intelligently applied usually assures satisfaction to the user. It reduces to a minimum the return of the blades a few days later on the ground that they are "defective"—when as a matter of fact the customer may have carried out saws perfect in point of both material and workmanship but which, when made at the factory, were intended for an entirely different use.

It is axiomatic that to be successful a salesman must really know the product he handles, and where the particular product happens to be saws it is especially essential that he knows his line—if he expects to hold his trade.

But, "to get back to our mutton," this story was primarily intended to help the hardware man sell saws, and particularly hand saws, the hack saw incident previously mentioned being used merely to illustrate the point.

The Fundamentals of Hand Saw Making.

In advising with a customer as to the purchase of a hand saw first learn whether it is intended for some special cutting purpose, or as a general utility blade.

Despite all claims to the contrary no saw ever made adapted itself with equal facility to all kinds of cutting; some styles go a long way in that direction but we have not yet reached the millennium in the art of saw making. This indisputable fact applies with equal force to other styles of wood and metal cutting saws, as well as hand saws. Do not sell the plumber a saw especially made for the ship carpenter, or vice versa; do not try to make the job fit the saw, but rather sell a saw made for the job.

It is fundamental that no saw blade can be good unless it is made of good steel, for the raw material is to the finished saw what the foundation is to the building, the keystone to the arch. Opinions differ among saw manufacturers as to saw

steels, each of the four or five leading hand saw manufacturers of this country—and there are but about four or five large producers of hand saws in the United States, using steels made to special analysis developed in their own laboratories. But the basic elements of the several steels used in the fabrication of the leading saw brands are the same—the differences being in the proportion of alloys and other steel elements employed. Saw steel must be strong in carbon and low in sulphur; it must have proper proportions of manganese, chromium, silicon, molybdenum and other ingredients.

But, even the highest grade steels can be made unsuited for fine saw making if improperly heat-treated. The leading saw manufacturers harden their saw plates in electrically-controlled furnaces, afterwards tempering or drawing them down in oils and special apparatus built for the purpose. At the Ohlen-Bishop plants, where the well-known "Ohlen" and "Bishop" saw brands are made, this heat-treating equipment was designed and built in the company's own shops, but the other standard saw manufacturers employ somewhat similar processes and equipment, each plant having its own, based upon long experience and scientific development.

As a consequence, exact hardness and temper is assured, with perfect uniformity throughout the blade. Unless great care is exercised the blades may be too hard, in which case they may crack and, too, filing and setting the teeth becomes difficult. Or, they may be too soft, in which event they will bend readily and "hold their set" the teeth not standing up in the work.

Other important elements in hand saw manufacture have to do with the smithing of the blades, and the placing of proper tension, all of which is done by hand, on the anvil, and by experienced saw smiths. Unless the blade is properly tensioned it will not stand up in operation; these processes take out what is known in the trade as the "fast" and "loose," in other words, the blade is made firm throughout its entire length and width, so that it will cut straight.

Again, the blade must be skilfully ground, high-grade saws being ground "tapered" to the back, so that the blade will clear and not bind in the cut. Taper ground saws are of even thickness along the entire cutting edge and are of the same gauge on the back, at the butt, gradually tapering towards the point, on the back. Thus, the blade is made stiff, but has ample clearance, runs free and easy with but little set required.

The style of the tooth, and the manner in which it is filed and set have much to do with the efficiency of the blade, in certain kinds of work. The term "Points to the Inch" means the number of tooth points on the cutting edge within the space of one inch. This term is rather confusing to the layman, and is generally misunderstood. It does not mean, for example, that in a five point saw there are five entire teeth to the inch. On the contrary, there is one less tooth per inch than there are points. In setting a saw care should be taken that the tooth is not set below its base, or below the gullet, in other words.

Outside of the foregoing considerations, it is important to note that the blade is properly assembled to the handle; that the completed tool has the proper "hang" or "balance," without which no saw will cut easy or run smooth. This feature is always looked for by the experienced carpenter, who understands its meaning in a long day's work. A saw that hangs like a club is imperfectly made and tiresome to the operator. Still further, the handle must be made of selected woods, thoroughly seasoned, to avoid warping, breaking and shrinkage. "Bishop" and "Greyhound" hand saw handles are fabricated out of Mahogany, Apple, Walnut, Cherry, Beech or Gum, depending upon the style of the saw, and its grade, which has been naturally seasoned in the company's own yards for at least three years.

A cheap hand saw is not usually a good investment. As a general proposition, it is much safer to offer a customer a saw bearing the maker's or the jobber's name or trademark. Such saws have a firm warrant behind them, and the dealer may rely upon replacement if defects appear with respect to either material or workmanship. A good saw costs but little more than a cheaply made blade of uncertain origin and assures satisfaction to the customer with "come-back" patronage.

Finally, in demonstrating the merit of a high grade hand saw direct attention to these essential features—which every good hand saw should possess:

Exactness and uniformity of hardness and temper-assuring toughness, spring and long life to the sharp and keen cutting teeth.

Even toothing, with sharp points carefully filed and set. See that the set does not extend below the base of the tooth or the gullet.

Accuracy in grinding, with the blade at uniform gauge along the cutting edge and gradually tapered to the point, on the back, to allow proper clearance and to permit free and easy operation without binding and with but little set.

Skilled smithing to remove all unevenness from the blade and permit it to cut true to the line.

Correct balance, or "hang" to assure ease in operation.

Well seasoned hardwood handles to avoid warping and shrinking and that the blade may always stay firmly in place.

The six points just mentioned have to do with the practicability of the tool only, and not with mere appearance. Other features — as for example, fine polish, style of screws, plain or carved handle, manner of etching, etc., are obvious and need no elucidation.

Space forbids a more detailed explanation of the many processes incidental to saw manufacture, but it is hoped that a careful reading of the "high-points" here set out will be of assistance to the retail salesman and will enable him to guide a saw buyer in the right direction.

Suggestions and Plans for Window Displays.

Instructive Examples from Exhibits in AMERICAN ARTISAN AND HARDWARE RECORD Window Display Competition.

HUNTING PARAPHERNALIA IN EXCELLENT DISPLAY.

A number of exceptionally fine window displays arranged by M. E. Klasky for the Kelley-Duluth Company, the progressive hardware store at Duluth, Minnesota, have been reproduced and described in the columns, and the one on this page is fully on a par with its predecessors.

Mr. Klasky has taken for his subject that of hunters' accessories, and he has handled his subject in a highly efficient and creditable manner.

This window display was arranged just at the opening of the hunting season and was instrumental in boosting the sales of guns, shells, and all the various articles that a hunter wants and needs when going after the wild birds and game of the northern woods and lakes.

We quote from Mr. Klasky's letter, describing the photograph which he submitted for the recent Window Display Competition conducted by AMERICAN ARTISAN AND HARDWARE RECORD:

"This window was put in during the opening of the duck hunting season. We had live, wild Mallard ducks in the display, but they hid themselves behind the tree in the corner while the photograph was taken.

"The background pictured a scene from one of the nearby hunting lakes, with real trees and cat tails and a miniature pond in which the Mallards swam around.

"A duck hunter, dressed in full hunting costume, with a duck boat, loaded with all sorts of paraphernalia, is shown at the left.

"He is supposed to spy the ducks in the pond to the right and is reaching for his gun, being concealed by the screen of cat tails and bushes in the center.

"The large card in the center of the foreground announces that live and wooden decoys can be purchased in the store and also mentions various brands of shells.

"Plaster of Paris Mallards on the fly were tacked to the wall at the right.

"The sidewalk was always crowded with onlookers and our sales of guns, ammunition and hunter's accessories were exceptionally large."

Fine Window Display of Hunter's Accessories, Arranged by M. E. Klasky, for Kelley-Duluth Company, Duluth, Minnesota.

This is the future to which you were looking forward ten years ago. Have you accomplished the things you thought you would have accomplished by this time? If not, why not? Be honest in placing the blame.

Hardware Club of Chicago Holds Its Annual Field Day at Ravinia Park.

Baseball, Horseshoe and Quoit Pitching Contests Cause Many Amusing and Wonderful Incidents.

THE weather was gloomy, the sky was cloudy and it had rained hard during the late hours of the night before, but that did not dampen the spirit of those who ventured out to Ravinia Park on the North Shore to attend the Annual Field Day of the Hardware Club of Chicago.

And when, a little after two in the afternoon, the sun came out and shed its warming rays on the playground in front of the big grandstand, the members and their friends had a fine time taking part in or watching a full nine-inning baseball game and the horse shoe and quoit pitching contests which had been arranged.

Scenes From Hardware Club Field Day. Oliver at Bat. Miss Tate, Mrs. Alman, Mrs. Shields and Mrs. Beaudin. The Siamese Twins, Vere Martin and Allan Coleman. The Baseball Game. Gus Ruhling Watching R. A. Whitney. Leaving First. R. A. Whitney, Bob Lee, Charlie Cunningham and George Beaudin, Champion Horse Shoe Pitchers. George Beaudin Coming Home. Arthur Watts, Allan Coleman, W. H. Oliver and A. G. Pedersen.

Henry Dormeyer proved himself to be superior, both as a captain of his ball team and also as a pitcher, for his team won the game by a score which can not be quoted accurately, as Arthur Watts, the official scorekeeper, ran out of paper by the eighth inning.

"Katy" Shields and S. E. Unmensetter alternated as pitcher and catcher on the other team, while Howard Vaughan stuck to his post as receiver of the weird curves and inshoots of Henry.

A. G. Pedersen, "Ye Editor," had the distinction of making the first put out—a fly from the bat of Vaughan—and of being the last one to be put out. He was also mixed up in a wonderful fielding feat by George Beaudin, who caught a throw from the field at the moment "Pete" thundered into third base. The two rolled around on the grass, but came up without broken bones and George was still holding onto the ball.

Gus Ruhling and W. H. Oliver both played a sterling game at first.

R. A. Whitney, a recent addition to the membership, who sells Duluth show cases, was a demon as a batter, base runner and short fielder.

"Bob" Lee, on third base, was fully equal to the valiant George Beaudin.

Bill Stroh could not get his eye on the ball, but played his position as second baseman in fine style.

Allen Coleman volunteered to act as umpire on balls and strikes, but proved his utter ignorance of the fine points, so Vere Martin stepped into the breach, but that did not seem to help much, for everybody who struck out kicked like a steer.

In the horse shoe and quoit pitching contests Charlie Cunningham, "Katy" Shields, George Beaudin, Allen Coleman, Jr., and "Bob" Lee proved the most proficient.

How Do Your Various Lines Compare in Sales?

The Harvard Bureau of Business Research has recently completed an exhaustive investigation covering the relative position in regard to sales of the various lines carried in the average retail hardware store.

A large number of stores were canvassed, and from the information secured the following table was prepared which should be of interest to many of our subscribers:

Wire and heavy hardware	12%
Household supplies	10
Stoves	6
Paint and oil	7
Builders hardware	6
Cutlery	3
Sporting goods	3
Carpenter's tools	3
Other tools	2
Garden implements	2
Miscellaneous, including seeds, electrical goods, harness, furniture, lumber, automobiles, fertilizers, tanks, troughs and other articles	46
Total	100%

Be very careful what you say to your enemies and be more careful what you write to your friends.

Hardware Store and Tin Shop Opens in Hutchinson, Kans.

Hutchinson, Kansas, has a new hardware and sheet metal shop.

On Monday, August 21st, the Hoskins & Young Hardware Store and Tin Shop was opened at 22 West First Street.

The members of this firm are "old timers" in the business circles of Hutchinson, as Earl C. Hoskins has conducted the Hoskins Tin Shop at the rear of 109 North Main and has been one of the Southwest's most popular tin and sheet metal men. L. L. (Si) Young has been for the past twelve years one of the most active and live wire hardware men, having been with the Nelson Hardware Company and recently with the Herlocker Hardware Company, as manager, which position he resigned to launch the new enterprise with Mr. Hoskins.

"We are going to do a general hardware, tin and sheet metal business. Our firm is the first hardware firm that has had the nerve to leave Main Street and launch into this line of business on a side street," said Mr. Young.

"It has been generally known that for years Main Street has had a monopoly on hardware stores. We feel that we save our customers and ourselves money by getting out of the high rent district. In other words, we believe that hardware and tin can be sold on some other street besides Main Street in Hutchinson if we advertise and give our customers nothing but the best of merchandise.

"Our middle name is service to whole big public of Southwest Kansas. In fact, already we have taken a number of large orders that will be shipped immediately. We believe that our friends and new customers are going to patronize the 'side street' hardware store."

J. B. Wilson Buys Hardware Store in Clinton, Illinois.

J. B. Wilson, sales manager of the May-Fiebeger Furnace Company, Newark, Ohio, has purchased the hardware store of D. T. Gano, at Clinton, Illinois, and has already taken possession, the stock having been invoiced and the store re-opened under the firm name of J. B. Wilson & Son.

Mr. Wilson was formerly a resident of Wapella, Illinois, but moved to Ohio about nine years ago. His son, J. Scott Wilson, will be associated with him in the management of the business.

Who Makes "Bright Spot" Water Power Washer?

To American Artisan and Hardware Record:

Can you advise me who makes the "Bright Spot" Water Power Washing Machine?

B. E. Lamson.

——, Texas, August 16, 1922.

Coming Conventions

National Hardware Association Marlborough-Blenheim Hotel, Atlantic City, New Jersey, October 17, 18, 19, and 20, 1922. T. James Fernley, secretary-treasurer, 505 Arch Street, Philadelphia, Pennsylvania.

American Hardware Manufacturers' Association, Marlborough-Blenheim Hotel, Atlantic City, New Jersey, October 18, 19 and 20, 1922. F. D. Mitchell, secretary-treasurer, 1819 Broadway, New York City.

Western Implement, Vehicle and Hardware Association, Kansas City, Missouri, January 16, 17, 18 and 19, 1923. H. J. Hodge, Secretary, Abilene, Kansas.

Texas Hardware and Implement Association, Dallas, Texas, January 23, 24 and 25, 1923. A. M. Cox, Secretary, 822 Dallas County Bank Building, Dallas, Texas.

West Virginia Hardware Association Convention and Exhibition, Huntington, West Virginia, January 30 and 31, and February 1, 1923. James B. Carson, Secretary, 1001 Schwind Building, Dayton, Ohio.

Indiana Retail Hardware Association Convention and Exhibition, Indianapolis, Indiana, January 30 and February 1 and 2, 1923. G. F. Sheely, Secretary, Argos, Indiana.

Michigan Retail Hardware Convention and Exhibition, Grand Rapids, February 6, 7, 8, 9, 1923. Karl S. Judson, Exhibit Manager, 248 Morris Avenue, Grand Rapids. A. J. Scott, Secretary, Marine City, Michigan.

Wisconsin Retail Hardware Association, Milwaukee Auditorium, Milwaukee, Wisconsin. February 7, 8 and 9, 1923. P. J. Jacobs, Secretary-Treasurer, Stevens Point, Wisconsin.

Pennsylvania and Atlantic Seaboard Hardware Association Convention and Exhibition, Philadelphia Commercial Museum, Philadelphia, Pennsylvania, February 12, 13, 14, 15 and 16, 1923. Sharon E. Jones, Secretary, 1314 Fulton Building, Pittsburgh, Pennsylvania.

Ohio Hardware Association Convention and Exhibition, Cleveland, Ohio, February 13, 14, 15 and 16, 1923. Exhibition in the new Municipal Hall. James B. Carson, Secretary, 1001 Schwind Building, Dayton, Ohio.

Illinois Retail Hardware Association Convention and Exhibition, Hotel Sherman, Chicago, Illinois, February 13, 14 and 15, 1923. L. D. Nish, Secretary-Treasurer, Elgin, Illinois.

Iowa Retail Hardware Association Convention and Exhibition, Des Moines, Iowa, February 13, 14, 15 and 16, 1923. A. R. Sale, Secretary, Mason City, Iowa.

New England Hardware Dealers' Association Convention and Exhibition, Mechanics' Building, Boston, Massachusetts, February 21, 22 and 23, 1923. George A. Fiel, Secretary, 10 High Street, Boston, Massachusetts.

New York State Retail Hardware Association Convention and Exposition, Rochester, New York, February 20, 21, 22 and 23, 1923. Headquarters, Powers Hotel. Sessions and Exposition at Exposition Park. John B. Foley, Secretary, City Bank Building, Syracuse, New York.

Retail Hardware Doings

Illinois.

Thomas A. Hickman of Ottumwa, Iowa, has leased the J. M. Bowton Building on North Main Street, Abingdon, and will soon open a hardware store at that place.

Frank Mayfield of the East Alton Hardware Company, East Alton, has enlarged his stock.

The Forest City Hardware Company, 1105-07 Fourteenth Avenue, Rockford, has been sold to A. W. Carlson.

Indiana.

Ozrow Kemerly of Greenfield has purchased the Redding Hardware Company at the corner of East New York and Garfield Streets, Indianapolis, from the owner, C. F. Redding. The new store will be known as the O. K. Hardware Store.

Iowa.

E. A. Jacobson of New Hampton has purchased the hardware business of the late W. B. Williston at Northwood.

O. A. Tenold of Northwood, who has been in the hardware business for twenty years, has sold it to Henry T. Gabriel.

Kentucky.

The hardware firm of Johnson Brothers of Nicholasville has dissolved partnership. J. L. Johnson will continue the business.

Missouri.

M. E. Costello, who purchased the Lathrop Hardware store, Lathrop, a few months ago, has sold it to Dan Arnold of Ottawa, Kansas.

Nebraska.

A deal has been completed whereby C. L. Carlson becomes the owner of the Hargleroad Hardware Store at Wilcox.

Ohio.

The J. F. McGee Hardware Company of Celina has been sold to E. C. and Leo Heckler of Coldwater.

Texas.

L. L. Hooker with W. H. Hooker will open a hardware store about September 15th at 1407 Elm Street, Dallas.

Evaporation of Small Amounts of Water Is Not Real Humidification.

Professor Kratz Discusses Results of Three Years' Test of Humidifying Appliances on Warm Air Furnaces.

(CONTINUED FROM AUGUST 26TH ISSUE.)

Description of Apparatus Used.

The plant on which the preliminary tests were run has been described in Engineering Experiment Station Bulletin Number 112, Report of Progress in Warm-Air Furnace Heating, by A. C. Willard. It consisted of a furnace with a 28-inch firepot installed under a skeleton house. This plant had ten leaders, of which four served the first floor, four served the second floor and two served the top floor.

The first pan used was the regular cast-iron pan furnished by the makers of the furnace, and was located in the front casting just below the feed neck for the coal, as shown in Figure 1. This pan had a total evaporating surface of 92 square inches, 60 per cent of which extended through the front into the space between the firepot and the front casting. It is probable that all of this surface should be considered as evaporating surface although it is not as effective as though air was free to circulate over the whole surface.

The second pan, Figure 1, was a shallow cylindrical pan placed on the dome of the furnace. The bottom of the pan was held about 2 inches above dome by three small legs.

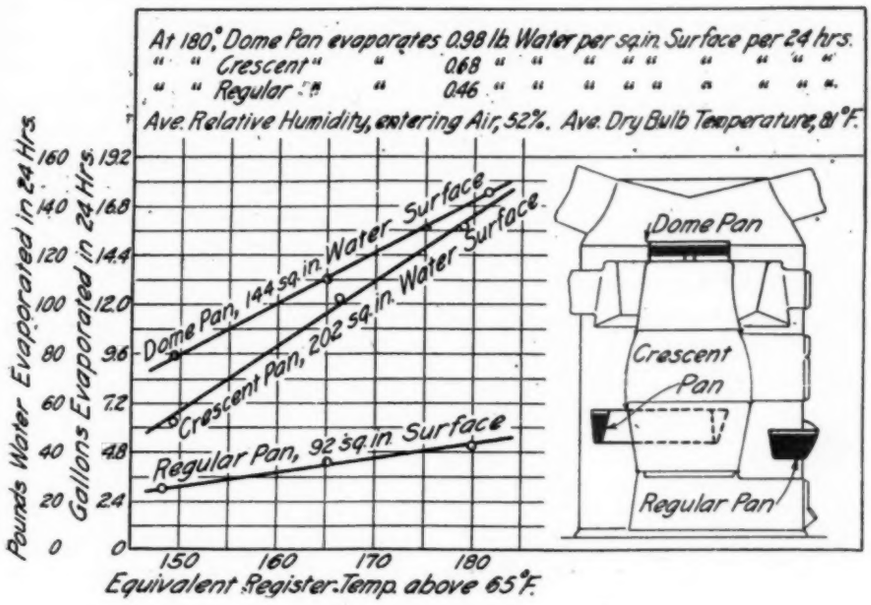

At 180° Dome Pan evaporates 0.98 lb. Water per sq.in. Surface per 24 hrs.
" " Crescent " " 0.68 " " " " " " " " "
" " Regular " " 0.46 " " " " " " " " "
Ave. Relative Humidity, entering Air, 52%. Ave. Dry Bulb Temperature, 81°F.
Pounds Water Evaporated in 24 Hrs.
Gallons Evaporated in 24 Hrs.
Dome Pan, 144 sq.in. Water Surface
Crescent Pan, 202 sq.in. Water Surface
Regular Pan, 92 sq.in. Surface
Dome Pan
Crescent Pan
Regular Pan
Equivalent Register Temp. above 65°F.

FIG. I.

The third pan, Figure 1, was crescent shaped, with a wedge-like cross-section. It was placed just inside the casing and extended practically all of the way around the firepot, a gap being left for the feed neck. The object in using a pan of this shape was to intercept part of the heat radiated from the firepot, as well as to increase the effective evaporating surface over that of the other two types of pans. For the tests in the laboratory, this pan had an evaporating surface of 202 square inches, which, however, was increased instead of 267 square inches before the pan was installed in furnace Number 2. The water in the feed neck of the pan was separated from the water in the pan by a bridge, and hence the feed neck was not considered as effective evaporating surface.

For the tests on furnace Number 3, a pan similar to the crescent-shaped pan used in furnace Number 2 was constructed. In this pan, however, there was no bridge between the feed neck and main part of the pan, and the surface in the feed neck was assumed to be effective evaporating surface. The total evaporating surface was 304 square inches when the water level stood 1 inch from the top edge of the pan. This pan was installed in the furnace, with the straight side toward the casing. The mean distance from the inside edge to the firepot was approximately 3 inches.

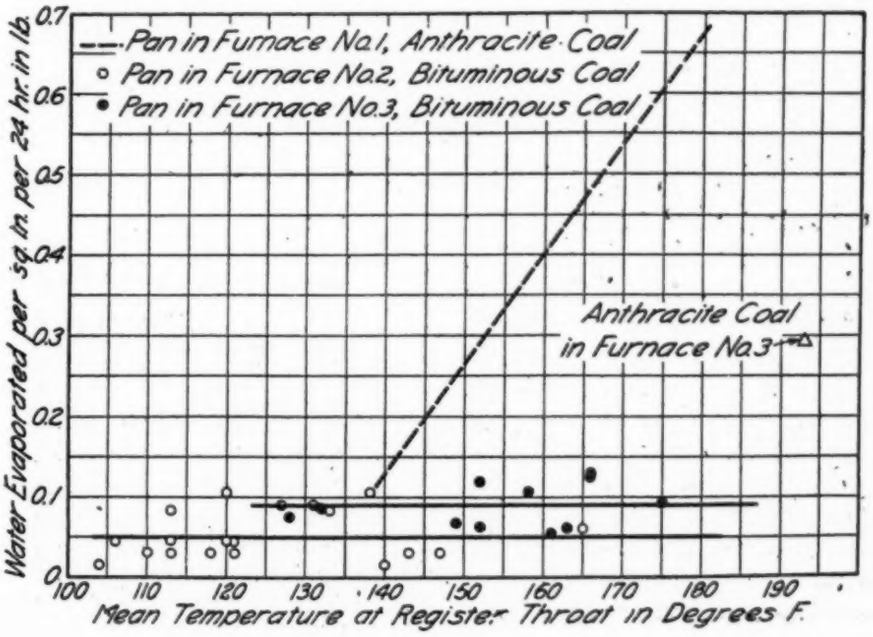

Pan in Furnace No.1, Anthracite Coal
Pan in Furnace No.2, Bituminous Coal
Pan in Furnace No.3, Bituminous Coal
Anthracite Coal in Furnace No.3
Water Evaporated per sq. in. per 24 hr. in lb.
Mean Temperature at Register Throat in Degrees F.

FIG. II.

TABLE 1.—RESULTS OF EVAPORATIVE TESTS ON CRESCENT-SHAPED PAN IN FURNACE NUMBER 2—BITUMINOUS COAL.

Readings taken daily from October 13, 1919, to November 9, 1919.

No.	Temp. of Outside Air, °F.	Temp. at Breathing Line, ° F.	Mean Temp. at Register Throat, ° F.	Relative Humidity, Per Cent.	Water Evap., per 24 hrs., gal.	Water Evap., per sq. in. per 24 hrs., lb.
1	52.0	74.6	147	50.2	1.0	0.030
2	54.0	72.3	118	57.0	1.0	0.030
3	47.0	72.9	138	47.7	3.5	0.105
4	50.0	74.0	143	45.0	1.0	0.030
5	61.0	71.3	113	50.0	2.5	0.083
6	57.0	71.5	113	57.0	1.0	0.030
7	49.0	70.7	104	55.0	0.5	0.015
8	46.0	69.7	120	54.0	3.5	0.105
9	58.0	74.0	113	58.0	0.5	0.015
10	65.0	75.0	95	65.0	0.5	0.015
11	48.5	74.0	140	55.5	0.5	0.015
12	59.0	74.0	106	65.5	1.5	0.045
13	38.0	70.3	133	51.0	2.5	0.083
14	45.0	73.5	131	50.0	3.0	0.090
15	52.0	71.5	165	53.0	2.0	0.060
16	45.0	72.0	110	48.0	1.0	0.030
17	36.0	69.0	113	44.0	1.5	0.045
18	33.0	70.0	127	44.0	3.0	0.090
19	44.0	70.0	121	50.0	1.0	0.030
20	46.0	71.0	113	50.0	1.5	0.045
21	48.0	71.0	120	49.0	1.5	0.045
22	55.0	75.0	121	48.0	1.5	0.045
Mean	49.4	72.1	122.7	52.1	...	0.049

The inner lining of the casing extended about 2 inches below the bottom of the pan. The furnace in which the pan was used had a 24-inch slotted firepot and a 22-inch grate. The diameter of the casing was 48 inches and the inside lining of the casing was 1 inch from the outside. The house had a cubical content of 22,340 cubic feet, excluding the basement and the attic, and it should be noted that the furnace was much too small for a house of this size. During the time of the tests all of the registers on the first floor, three in number, and four of the registers on the second floor were open. In all of the tests a constant water level was maintained in the pans.

Results of Evaporating Tests on Furnace Number 1.

The results of the evaporative tests run on the three types of pans in the furnace in the laboratory are shown in Figure 1. At a register temperature of 180 degrees, the evaporation per square inch of evaporating surface per 24 hours was 0.98 pound for the pan on the dome, 0.68 pound for the crescent-shaped pan and 0.46 pound for the regular pan. The total evaporation per 24 hours was respectively 140, 137 and 42 pounds. Thus the pan on the dome was most effective as a humidifier. Both the pan on the dome and the crescent-shaped pans were much more effective than the small pan of standard type. The crescent-shaped pan, however, intercepted and used part of the radiant heat. It should be noted that all of these preliminary tests were made with the furnace fired with anthracite coal.

The water evaporated per square inch of evaporating surface per 24 hours for the crescent-shaped pans used in the three different types of furnaces has been plotted against register temperatures. These curves are shown in Figure 2. Since the furnaces in the two residences were operated under service conditions and were not constantly under the control of skilled observers, the results were subject to wide variations and the relations indicated are, therefore, general. Furthermore, for all tests conducted in the laboratory on furnace Number 1 anthracite coal was used, while for the other tests bituminous coal was used. The evaporative rate for the crescent-shaped pan in furnace Number 1 rose very rapidly as the register temperatures increased. The mean value of 180 degrees register temperatures was 0.675 pounds evaporated per square inch per 24 hours. For the crescent-shaped pans in furnaces Number 2 and Number 3, the evaporation rate was practically constant over the whole range of register temperatures. The mean rate for furnace Number 2 was 0.049 and for furnace Number 3 was 0.089 pounds per square inch per 24 hours. The results for these tests are shown in Tables 1 and 2. The fact that the pan in furnace Number 3, placed midway between the casing and the firepot, shows a higher evaporation rate than the one placed against the casing, in furnace Number 2, seems to indicate that the first position mentioned is the more advantageous location for the pan.

The fact that the evaporation curve for the pan in furnace Number 1 in which anthracite coal was used rose very rapidly with the register temperature, while the curves for the pans in the furnaces where soft coal was used fell very much below this curve and did not rise with increased register temperature, led to the conclusion that the evaporation was dependent upon the radiation received from the firepot. Since hard-coal fires are much hotter than soft-coal fires, and the fuel bed is denser, much more heat is radiated from the hard-coal fire than from the soft coal. In order to establish some relation between character of the fuel bed and evaporative rate for this pan a test was run on April 27, 1920, using hard

TABLE 2.—RESULTS OF EVAPORATIVE TESTS ON CRESCENT-SHAPED PAN IN FURNACE NUMBER 3—BITUMINOUS COAL.

Readings taken during period from January 31, 1920, to March 12, 1920.

No.	Length of Run, Hr.	Temp. of Outside Air. ° F.	Mean Temp. at Register Throat, ° F.	Temp. of Water in Pan, ° F.	Total Water Evap., lb.	Water Evap. per 24 hr., lb.	Mean Evap. Surface, sq. in.	Water Evap. per sq. in. per 24 hr., lb.	Relative Humidity Per Cent.
1	11.00	21.0	...	...	19.89	43.4	291	0.150	23.0
2	21.08	34.5	...	...	20.97	23.9	275	0.081	....
3	15.33	38.0	149	...	12.12	19.0	284	0.068	31.0
4	12.00	32.0	163	...	9.36	18.7	304	0.062	30.0
5	11.75	28.0	161	...	8.03	16.4	296	0.055	28.7
6	12.00	37.0	152	104	17.35	34.7	296	0.117	28.7
7	12.00	15.0	152	124	9.36	18.7	296	0.063	29.7
8	11.25	11.0	158	129	14.72	31.4	296	0.106	29.7
9	16.25	14.0	158	140	18.72	27.7	296	0.094	27.2
10	8.50	6.0	136	118	13.40	37.8	296	0.128	27.9
11	12.00	0.0	166	120	18.72	37.4	296	0.126	33.0
12	13.00	27.0	175	112	14.72	27.2	296	0.092	33.0
13	26.00	21.0	132	124	28.05	25.9	296	0.086	23 5
14	22.00	20.0	81	80	20.05	21.9	296	0.074	20 5
15	44.75	33.0	128	...	41.45	22.2	296	0.075	26.0
16	137.25	31.5	...	...	116.40	20.3	304	0 068	....
17	168.00	31.0	...	...	153.70	21.9	291	0.074	....
Mean	.....	....	...	...	.....	....	...	0.089	....

coal in furnace Number 3. The results of this test are given in Table 3. The mean evaporation rate at a register temperature of 193.5 degrees was 0.292 pounds of water per square inch per 24 hours. At the same register temperature, when soft coal was used, the evaporation was 0.089 pounds per square inch per 24 hours. Thus the evaporation for anthracite was 3.4 times that for bituminous coal. This is shown in the curves in Figure 2 in which the point for hard coal fell above the curve shown for furnace Number 3.

Analysis of the results in Table 3 prove that the evaporative rate changed with a change in the intensity of radiation. The radiation reached its maximum intensity during the hour between 11:00 and 12:00 a. m., when the evaporation was 0.407. At this time the total mass in the fuel bed had become incandescent and had not lost much weight. Also very little ash had been formed. From this time on, until 10:00 p. m., the rise in the temperature of the air remained about constant, or varied on either side of a mean, while the evaporation gradually decreased. This was due to the fact that the weight of fuel was constantly becoming less while the temperature of the fuel bed remained about the same. At the same time, ash was being formed on the sides of the firepot, thus reducing the radiant effect of the incandescent fuel. After firing a fresh charge at 9:30 p. m., the evaporation decreased. As this black bed became incandescent, the evaporation increased until 1:00 a. am., when it reached a value nearly the same as the one toward the close of the first firing period. This indicated that the ash had an appreciable effect in reducing the radiation from the fuel bed. The first three hours and the readings subsequent to the second firing have not been included in the average evaporation for the anthracite, in order to obtain values comparable with the fuel bed in normal running condition. This means value is higher than the mean of all readings, while the mean air temperature remains nearly constant.

TABLE 4.—HUMIDITY RESULT, BEFORE INSTALLING CRESCENT-SHAPED PAN IN FURNACE NUMBER 3—BITUMINOUS COAL.

Readings taken daily from December 2, 1919, to December 25, 1919.

No.	Temp. of Outside Air. ° F.	Temp. at Breathing Line, ° F.	Temp. Diff. Inside and Outside, ° F.	Mean Temp. at Register Throat ° F.	Mean Basement Temp., ° F.	Temp. at Throat of Recirculating Duct., ° F.	Relative Humidity, Per Cent.	Coal Fired per 24 hr., lb.
1.....	18.5	65.5	47.0	239	....	....	20.5	...
2.....	13.0	64.9	51.9	166	....	60.0	20.0	...
3.....	30.0	70.0	40.0	131	....	63.0	25.0	...
4	30.0	72.5	42.5	156	....	62.0	25.0	...
5.....	33.5	74.0	40.5	193	....	64.0	27.3	...
6.....	28.0	68.5	40.5	166	....	63.0	25.0	...
7.....	25.0	69.1	34.1	136	....	60.0	24.8	200
8.....	14.0	66.8	52.8	152	....	57.0	21.5	213
9.....	3.0	56.0	59.0	215	....	46.0	21.5	225
10.....	28.0	68.1	40.1	176	....	54.0	20.0	200
11.....	36.5	75.3	38.8	154	....	62.5	23.0	144
12.	11.0	65.8	54.8	165	....	52.0	20.5	206
13.....	20.0	64.5	44.5	238	....	49.0	....	219
14.....	13.0	62.5	49.5	149	51.0	48.5	25.0	162
15.....	20.0	67.5	47.5	112	54.0	54.0	21.0	181
16.....	26.0	67.5	41.5	120	54.0	57.0	28.0	150
17.....	32.0	74.0	42.0	185	59.0	61.0	27.0	131
18.....	26.0	66.0	40.0	121	....	....	....	138
19.....	32.0	68.5	36.5	149	55.0	57.0	26.0	125
Mean...	22.8	67.7	44.9	164.5	54.7	57.0	23.6	177

Note—Maximum register temperature—294 degrees Fahrenheit.
Minimum register temperature observed—84 degrees Fahrenheit.

Effect of Pan on Increase in Relative Humidity.

The results of the tests run before the installation of the crescent-shaped pan in furnace Number 3 are given in Table 4 and the results of the tests run after the installation of the pan are given in Table 5. The immediate effect of the pan was to increase the mean relative humidity from 23.6 per cent to 28.4 per cent, or an increase of 20.3 per cent over the original relative humidity. The mean temperature difference between air at the breathing line and outside air was 44.9 degrees before installing the pan, and 46.0 degrees afterward. The register temperatures, however, showed a marked decrease after the installation of the pan. The mean register temperatures before the installation were 177.0 degrees and 147.5 degrees afterward.

That is, it required register temperatures averaging 29.5 degrees less in order to give a range in temperature 1 degree greater. This is attributed to the higher specific heat of the water vapor in the air, which enabled the weight of air circulated to carry the same amount of heat at a lower mean temperature. This is significant in view of the fact that from the standpoint of comfort it is desirable to introduce the air for heating at as low a temperature as is consistent with the maintenance of proper temperature at the breathing line.

(To Be Continued)

TABLE 3.—RESULTS OF EVAPORATIVE TESTS ON CRESCENT-SHAPED PAN IN FURNACE NUMBER 3—SCRANTON ANTHRACITE COAL.

No.	Time.	Temp. of Outside Air, ° F.	Mean Temp. at Register Throat, ° F.	Mean Temp. at Cold Air Face, ° F.	Mean Temp. Rise, ° F.	Temp. of Water in Pan, ° F.	Water Evap. per sq. in. per 24 hr.	Relativ Humidity Per Cent
1.....	8:45 a.m.	....	.....	....	.....	...	.....	....
2.....	9:00	48.0	154.0	63.0	91.0	...	.....	....
3.....	10:00	48.0	207.0	68.0	139.0	162	.....	69.0
4.....	11:00	49.0	167.0	70.0	97.0	167	0.224	44.0
5.....	12:00	47.0	215.3	71.5	143.8	178	0.407	53.0
6.....	1:00 p.m.	47.0	181.5	74.0	107.5	161	0.328	43.0
7.....	2:00	48.0	186.0	73.5	112.5	165	0.336	40.0
8.....	3:00	46.0	197.0	74.5	122.5	165	0.312	43.0
9.....	4:00	45.0	185.0	74.0	111.0	160	0.328	45.0
10.....	5:00	44.0	199.5	75.5	124.0	163	0.280	48.0
11.....	6:00	43.0	225.0	76.5	149.0	165	0.312	40.0
12.....	7:00	44.0	186.4	65.0	121.4	148	0.264	34.0
13.....	8:00	43.0	171.0	74.0	97.0	144	0.208	37.0
14.....	9:00	44.0	185.0	74.0	111.0	138	0.200	34.0
15.....	10:00	44.0	197.0	74.5	122.9	128	0.240	35.0
16.....	11:00	....	191.0	75.0	116.0	144	0.208	....
17.....	12:00	....	169.0	74.5	94.5	146	0.136	....
18.....	1:00 a.m.	....	194.0	74.5	119.9	146	0.208	....
Mean of Readings 5 to 15		45.0	193.5	73.5	120.0	156.0	0.292	41.0

Note—Mean evaporating surface = 300 square inches.
Fire was not incandescent during starting period from 8:30 to 11:00 a. m.
Fresh coal fired at 9:30 p. m. Fire black then.

Good health is of first importance in getting a good bank account and in enjoying it after you get it. Make your health a first care.

Practical Helps and Patterns for the Tinsmith.

Aids to the Improvement of Craftsmanship and Business. News from Various Branches of the Sheet Metal Trade.

LAYING OUT LARGE HOPPERS.

By O. W. Kothe, Principal, St. Louis Technical Institute, St. Louis, Missouri. Written especially for American Artisan and Hardware Record.

Some sheet metal shops do considerable heavy iron work in the making of stacks, hoppers, tanks, etc.

In our drawing, we have a double hopper, made of number 10 iron and it is 10 feet 10 inches wide at the top and 5 feet 6 inches in width and 5 feet 7 inches deep.

Owing to the largeness of fittings of this kind, it is often best to lay them out to a scale of 3 inches to the foot and then draw the lines subdividing the plates after which scaling them, and filling in the measurements, so that the plates can be marked off to these measurements without further development.

In this, we first draw the front elevation according to size and shape desired, and then we draw the side elevation to conform with the front.

Now to lay out the pattern for the front, we pick the line C-E from side elevation, and set it as X-E of front elevation.

Then we draw a horizontal line to this point and then from points J-K and G-H we drop lines to this line and that enables us to draw the outline for pattern as shown by the dotted line.

Observe the throat or the saddle cut is taken as E-I" in side elevation and set as E'-I' in pattern and that enables drawing this cut.

Observe that the front elevation is already a pattern for the back, since the back is straight.

Now to lay out the pattern for the sides, we pick the side line B-G and set as G-G" and square out a line as E" and then C-E" is the true pattern for the sides of hopper.

For the side saddle pieces we pick the length H-I from front elevation and set as H-a and square out lines making a-I" as a-I" in pattern and F-E as H-E in pattern. This enables drawing the throat line.

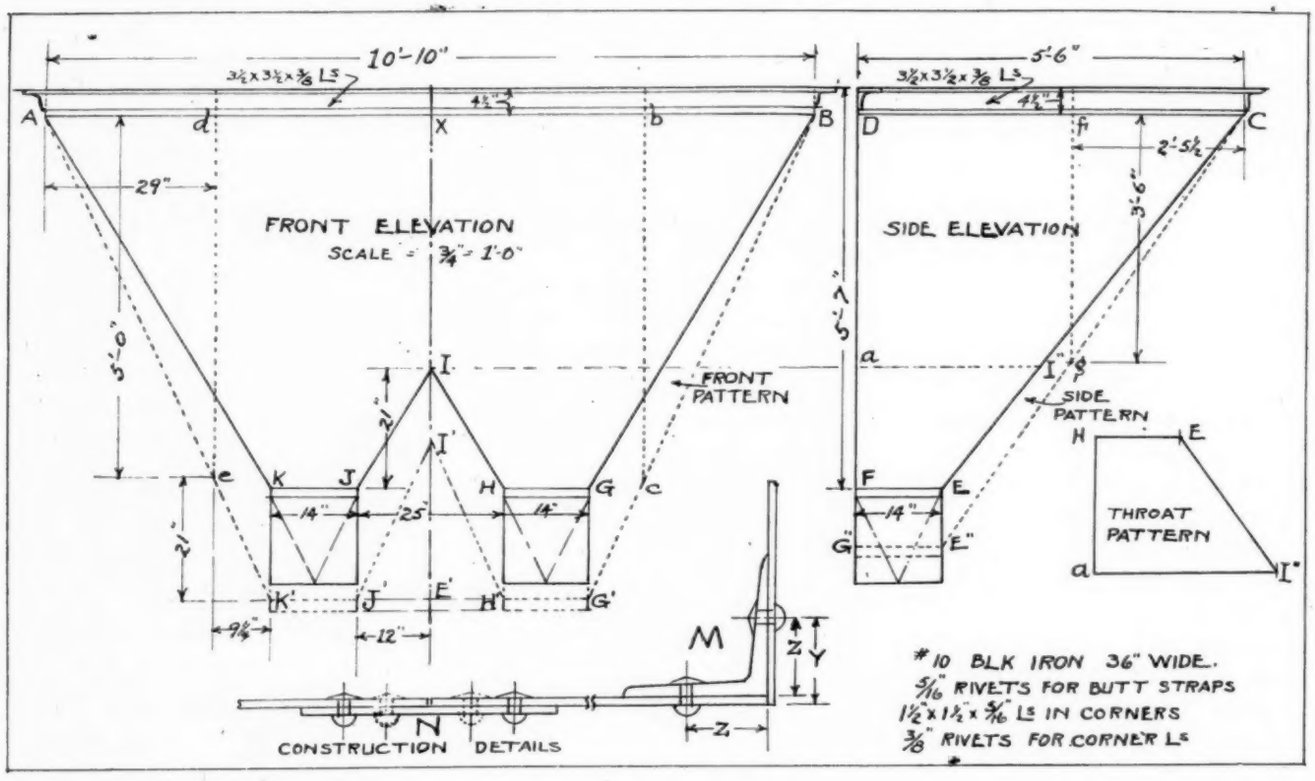
Now as the material to be used is 36 inches wide, we start at a convenient place and mark off the 36 inches as X-b and X-d and drop lines.

A seam would be placed along X-I' and these 2 sheets would be cut as X-I'-K'-e-d.

Then the side or corner pieces would be made equal to the measurements shown by e-d-A-e.

The same would be true with the side elevation and then these measurements would be picked from the scale drawing and transferred direct on the large sheet.

For straight work of this kind, it is entirely suitable to draw things



Laying Out Large Hoppers.

on a smaller scale and then enlarge the scale to full size for laying out on the sheet.

Where much curved development is met with, the practice is not recommended, although it can be used at times with more or less success.

The corners of these hoppers are either welded or assembled by means of angle iron shown in sketch M.

Where the angle irons are used, the center of webs must be determined as the distance Z.

To make a decent looking joint, the front should be wider as at Y, so an off-set corner is not produced.

As the straight seams or butt strapped at M staggering the rivets, and rivets are placed every 2½ to 3 inches apart, the matter of spacing the butt strap and marking the holes from the butt strap to the plates, or vice versa, is a very simple one.

It is best always to punch holes in the plates first, and then fit in place and lay the angle iron in and mark the holes for the angle iron after, although with practice a person can lay out the holes in the angles as well as the plates with a thorough degree of accuracy.

Bill Johnson Learns Something About Potatoes and Their Relation to Business.

Even When You Top the Bucket It Is Not Entirely Full, and in the Same Way, There Is Room for More Than One Idea in a Man's Brains.

Written Especially for AMERICAN ARTISAN AND HARDWARE RECORD by J. C. Greenberg, Cleveland, Ohio.

BILL JOHNSON and I were talking business when a huxter came in to ask Mrs. Johnson whether she desired some new potatoes. She bought some and while the huxter went to his wagon to bring the potatoes, she went into the kitchen to bring something to put them into. On her return she brought a five gallon pail in which she put the potatoes and went back to the kitchen with them.

Bill smiled and said, "There is a good business. That huxter sells for cash, gets his money right on the job and knows every night just exactly how he stands. I wish that I could do business that way."

"Well," I replied, "I guess that he has his troubles too. All that we can see is the sale, but I'll bet if you were to question him he probably would have a list of troubles, just like any other business man."

"Maybe so," Bill answered, "but the ease with which the deal is closed gets me. All that he had to do was to come in, find out if she wanted any potatoes, make the sale, get his money and say good bye. Some business I'll say."

I just smiled, that was all. Bill asked me why I smiled, and I told him.

"Bill," I said, "All that you saw was the transaction, and it took up all of your attention. I have really learned a sermon from that pail full of potatoes. I have learned a lesson that will stick by me for life. You only saw potatoes, while I saw a brain process in that pail full of potatoes that is worth a lot of money to me."

"You are a peculiar nut," Bill laughed, "you are forever seeing things that escapes other people. I can't see what in sam hill you could see in a pail full of potatoes that was so interesting. Potatoes are potatoes. They are a plebian vegetable. Who ever heard of a beautiful thought coming from a pail full of spuds. Haw-Haw-Haw."

"Keep right on laughing, Bill," I also laughed, "but listen to this and tell me what you think of it. Before you listen run back into the kitchen and fetch that pail full of potatoes."

Bill did as I asked him to do, and on his return Mrs. Johnson came with him. He set the potatoes on the bench and said, "shoot."

I did shoot. I shot this at him and Mrs. Johnson:

"See this pail is apparently full of potatoes, and good measure at that. They are nice large potatoes, and look tempting, don't they? Well, this pail is not really full at all. You could put a handful of peanuts into it and they would fill some of the spaces between the potatoes. Is that right, Bill?"

"Yes, it is," he replied.

"Now then," I went on, "you could take a handful of peas and put them into the pail, and they would fill up the still smaller spaces between the potatoes and peanuts. Still the pail would not be full. Suppose we would take a handful of barley and put it into the pail, they would still fill up smaller spaces. Is that right, Bill?"

"Sure, it is," he said, still laughing.

"Then," I said, "fill the smaller spaces with salt and perhaps you would have the pail full."

Bill and Mrs. Johnson just laughed till the tears rolled down their cheeks. I simply had to laugh myself. Finally Bill asked, "After all that filling process is done, what then?"

"After that is all done," I replied, "you stop and think, and learn how the business brain works."

"That is rich indeed," Bill laughed again. "Potatoes and brains are a fine combination. I thought that fish was brain food."

"Now Bill," Mrs. Johnson spoke up, "do have some manners. Please let him explain himself."

"All right," Bill said soberly, "what has potatoes and peanuts and peas and barley and salt to do with business?"

"It has this to do with business, Bill," I answered. "Suppose that we call your head the pail and the potatoes the ideas you have about business. You have some good ideas, but there is room between the ideas for still smaller and yet useful ideas. Your big ideas, like the potatoes, are not filling your business brain. You still can learn a lot and get ideas between the ideas you have. The new ideas that you can get if you want to, will fit in between the ideas you have just like the peanuts and peas and barley and salt would fill in between the potatoes.

"The trouble is that most business men think that their heads are so full of good ideas that there is no more room for new ideas. Forget it, Bill. There is always room for more ideas in your head, just like there is in this pail full of potatoes. We are all that way. I'll bet that the huxter envied you for having a sheet metal shop and not having to huxter potatoes. It is all because he thinks that he knows all that he should know. He too, thinks that his head is full and overflowing."

Mrs. Johnson listened intently, and then turned to Bill and said. "Now laugh, Bill. Laugh if you want to, but you are not as smart as you think you are. Potatoes for mine, Bill."

Bill stopped laughing and just scratched his head. Did you ever notice that some people scratch their heads and think while others just scratch their heads alone?

Well, Bill scratched his head and thought.

It is just that way with most of us. We have a few ideas about business and call all bets off. Instead of getting more ideas to fill in the empty spaces in our heads, we just save that room for a place to worry with.

Just stop and think, Mr. Sheet Metal Man. Can you learn more than you know? Do you want to know more about business? If you do, just lay aside a little time to study. If you are a young man and still have your life before you, learn —Learn—LEARN. Your present ideas are just like the potatoes. They are big. They are outstanding.

For example, your big potatoes are, Business, Money, Buying, Selling, Collecting, Advertising, Discounting and a lot of other like ideas. Now then, if you will just study and learn HOW to carry out properly your ideas that are big, you will be filling out the spaces between the big potatoes.

No idea is big unless you have the ability to carry it out. Any fool can give you ideas how to make a million dollars, but it takes many ideas to carry the one big idea out. See the point?

Resolve to learn, and to fill up the brain box. Remember that big ideas are not good unless you have the little ideas in between which will help you to carry them out and become successful.

There is more room in between the ideas than we think, but we do not like to admit it to ourselves. Let us get on the job and fill in.

Fill in—FILL IN—F I L L I N.

Water Method Is Quickest Way of Testing for Leaks in Automobile Radiators.

Zideck Tells Why It Is Unnecessary for Mechanic to Get Wet While Making Such Tests.

Written Especially for AMERICAN ARTISAN AND HARDWARE RECORD by E. E. Zideck, New York City.

THE only advantage the wet process of testing radiators has over the dry process is quickness in detecting leaks.

In factories, where new radiators are being made, and where the men working at the testing and soldering up of leaks in the new radiators are trained in that particular operation only, quickness is the main requirement.

In their case, leaks are easily soldered, because the metal is new. Also, the leaks occur almost invariably in the same places. And what they are after is to see that the places where the leaks are common, are soldered tight.

Considering that in most factories this work is being paid by piece, and that the rate per radiator seldom exceeds the handsome sum of 12 cents, it is easy to understand why qnickness is essential.

Everything else is sacrificed to the one consideration of quickness. Accordingly, there are cement floors built with cavities in them for spilled water to flow off and keep the floors dry. Where this is not done, the floors are flooded. The men stand upon a wood lattice at the tanks to keep their feet out of water. They wear rubber boots and leather aprons to protect their bodies against being soaked.

With a dozen or so men working at the first test, the floor is a lake and water is everywhere. Even the girl-inspectors watching the men and noting down the numbers of the radiators one or the other has tested, must wear protecting garments. At that, rheumatic aches from exposure to wetness and standing upon wet floors day after day is a common experience.

Most of the radiator repair shops originally established independently of the factories, were patterned after the factory establishment. They were put up by men originally working in the factories. These men did not know but that which they had seen and learned at the factory. And their shops and their work were accordingly imitations of their factory experience.

One not acquainted with these facts and seeing a radiator repair shop and radiator repairing done for the first time, was indeed very much impressed. He saw very much water everywhere, the air pump going full steam, the blow pipe making an awful noise, and

the man himself feverishly at work handling the tool, submerging the radiator, the air bubbles coming forth, and more water spilled every time he had to test anew for the leak which would not be stopped.

That feverish haste and all that water and the noise were indeed impressive to the lay mind. But, in fact, all that was but a remnant of the factory experience of the man owning or running the shop—and it was not at all a thing to be impressed by, the man doing the work half blindly, just testing and soldering and again testing and soldering without the true mechanic's deliberation of what the leak might be; where it might be; and how it might be stopped once for all.

The factory man knew but one make of the core—if he did know it in all its parts and joints at all. He knew only one way of doing the work; the way which he had learned at the factory. And he was not fit to run a shop where all makes of radiators were brought in and where the true mechanic's knowledge and experience was of more value than the mere factory-quickness and expertness in handling that particular equipment and tools.

Still, that man and his shop were the pattern by which the sheet metal men and tinsmiths who took up radiator repairing later, were guided in fitting out their shops and doing their work.

But, being mechanics, they brought their minds into play and made various changes and put in plenty of improvements. They studied the construction of the cores. Once they knew the construction of a certain pattern of the core, they were able to tell the nature of a certain leak. And they did not test oftener than absolutely necessary.

Almost every regular radiator repair shop uses the water tank for testing. But many improvements have been made to prevent water from spilling and flowing over the floor.

Wood lattices are used on one side of the tank, for the radiator to lay upon when it is lifted from water. The water is allowed to drain back into the tank while the repairer solders up the newly detected leak.

Another improvement consists of a latticed platform inside of the tank, moved up and down at will. The radiator rests upon this platform and is submerged with it and lifted with it, the repairer just turning the radiator around upon it, for soldering, but never lifting it away from the platform. By this arrangement the water drains back into the tank, the radiator is out of water when soldering is done, and the repairer does not need to put his hands into the water lifting the radiator out of it.

This platform arrangement really does away with the spilling of water entirely. The repairer can submerge the radiator just as deep in water as he wants it for the test, lowering it or bringing it up slowly, without disturbing the water and causing it to boil and bubble.

Many times the test must be made with the radiator submerged partially, to see in which place the leak is located. Many times it is in that portion of the core nearest the face laying down; or it is in the middle of the core; or it might be near the face to the top. By having the platform movable by foot, the repairer is able to slightly move it up and down and get the exact location of the leak.

At the same time both of his hands are free to help detect the leak by holding pieces of wood or wire to where it appears, localizing it; and to use torch and solder, proceeding with the work of soldering, while his foot holds up the platform and the radiator out of water.

Still another addition to the above improvement is being tried: The air inlet into the radiator is so arranged as to automatically let in air when the radiator is lowered into water, and to shut off the air and release the air contained within the radiator when the platform is lifted out of water.

By the above arrangements the testing by water actually becomes a pleasure instead of a drudgery, as it still is in the factories. There is no necessity of spilling any water, and the repairer works in the dry, even his hands, remaining dry if he choses so.

(To Be Continued.)

Louis Follett, Tin Plate Maker, Dies from Automobile Accident.

Louis Follett, president of the Standard Tin Plate Company, Canonsburg, Pennsylvania, died in the Homoeopathic Hospital, Pittsburgh, Thursday, August 17, as the result of an automobile accident. Mr. Follet was motoring with friends, when his car was struck by another machine in a collision on Baum Boulevard, near his home in the East End, Pittsburgh. He was quickly removed to the Homeopathic Hospital, but in spite of the best medical treatment, he died in a few hours without regaining consciousness.

Mr. Follett was born in Melbourne, Australia, and was a graduate of the University of Paris. At the age of twenty-four he came to this country, and located in Pittsburgh where he engaged in business. Later he went into the manufacture of tin plate and was very successful. He was a member of the Union Club, the Field Club, the Fellow's Club, the Pittsburgh Athletic Association, the Traffic Club and the Chamber of Commerce, all of Pittsburgh. He leaves his widow, one daughter and three sons.

Sheet Metal Contractor Wants Catalogs of Machinery and Supplies.

The Shannon Sheet Metal Works, 1609 Bryan Street, Dallas, Texas, desires catalogs of machinery, tools and supplies for an up-to-date sheet metal shop.

Elbert Hubbard uttered a true statement when he said, "An ounce of loyalty is worth a pound of cleverness." The employee who is loyal to your interests is a far better man than the one who, although clever, is only thinking of himself and who holds the welfare of the firm to be of secondary consideration.

Collective Advertising Is Topic for Sheet Metal Men for September.

In a letter sent by National Secretary E. L. Seabrook to the members of local organizations of the National Association of Sheet Metal Contractors, he urges that right now, the contractors in each city or locality start in to advertise in a collective way and sends samples of such advertisements as have been used in Reading, Pennsylvania.

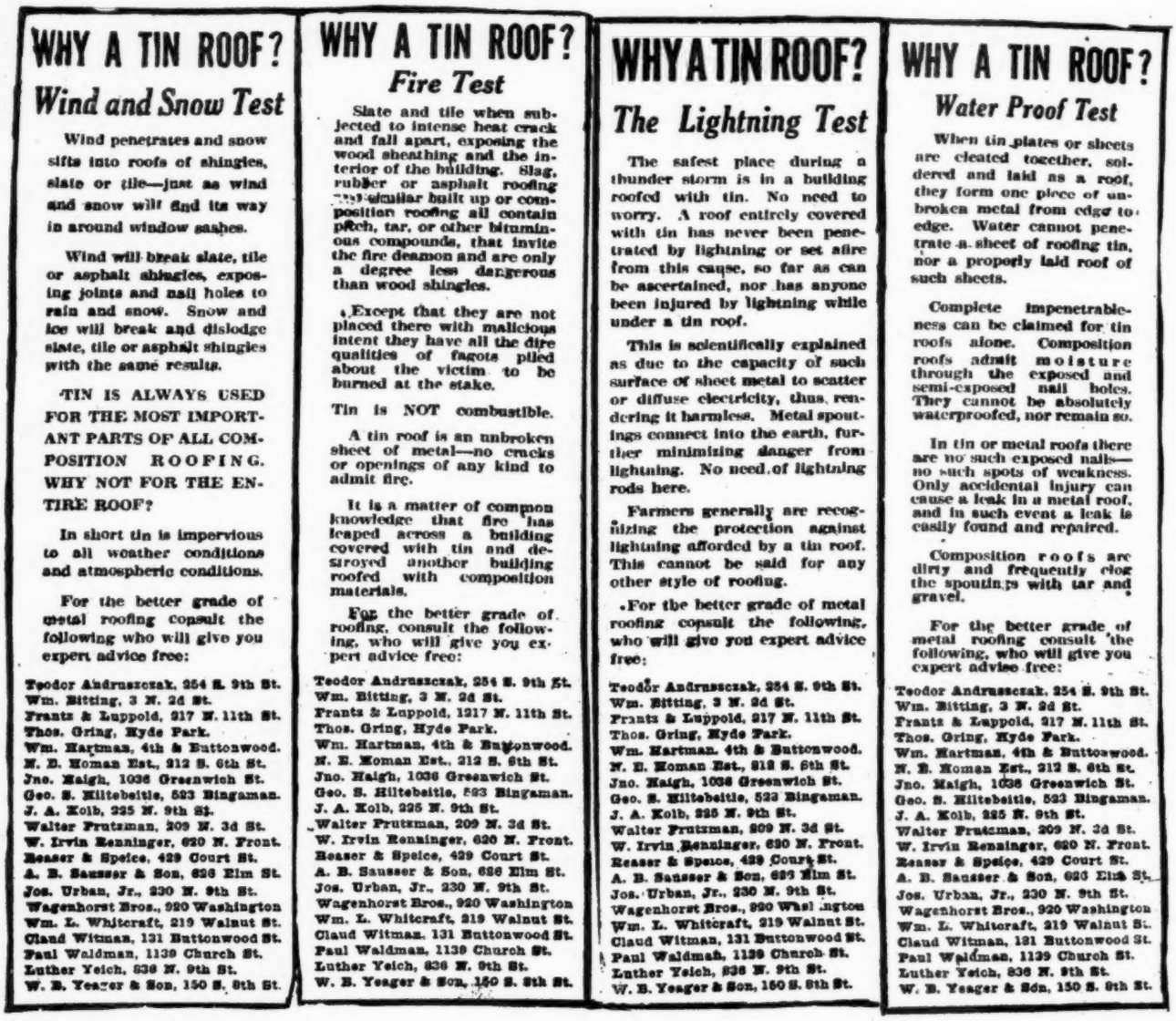
These subjects will be intensely practical and have a direct bearing on the conduct of the sheet metal business. It should be borne in mind, however, that there are nearly 100 locals connected with the National, that the interests of these vary and are somewhat diversified, and each subject may not appeal to all alike.

You are asked to discuss "Collective Advertising." In this connection do you not think it time for the sheet metal industry to induce the public to use more sheet metal? The public will do this only as it realizes the merit of sheet metal. Is it not up to those in the business to make this known?

Why is the demand for electrical appliances in the home so great today? The public has been educated to their use by publicity.

Why was the painting industry busy long after the depression set in, two years ago? In the "save the surface" ads you have the answer.

Every line of industry (except sheet metal) from the dealer up, through some publicity channel, is telling the public why it should use its products.



WHY A TIN ROOF?

Wind and Snow Test

Wind penetrates and snow sifts into roofs of shingles, slate or tile—just as wind and snow will find its way in around window sashes.

Wind will break slate, tile or asphalt shingles, exposing joints and nail holes to rain and snow. Snow and ice will break and dislodge slate, tile or asphalt shingles with the same results.

TIN IS ALWAYS USED FOR THE MOST IMPORTANT PARTS OF ALL COMPOSITION ROOFING. WHY NOT FOR THE ENTIRE ROOF?

In short tin is impervious to all weather conditions and atmospheric conditions.

For the better grade of metal roofing consult the following who will give you expert advice free:

Teodor Andruszczak, 254 S. 9th St.
Wm. Bitting, 3 N. 2d St.
Frantz & Luppold, 217 N. 11th St.
Thos. Gring, Hyde Park.
Wm. Hartman, 4th & Buttonwood.
N. E. Homan Est., 212 S. 6th St.
Jno. Haigh, 1036 Greenwich St.
Geo. S. Hiltebeitle, 523 Bingaman.
J. A. Kolb, 225 N. 9th St.
Walter Frutzman, 209 N. 3d St.
W. Irvin Renninger, 620 N. Front.
Reaser & Speice, 429 Court St.
A. B. Sausser & Son, 626 Elm St.
Jos. Urban, Jr., 230 N. 9th St.
Wagenhorst Bros., 920 Washington
Wm. L. Whitcraft, 219 Walnut St.
Claud Witman, 131 Buttonwood St.
Paul Waldman, 1139 Church St.
Luther Yeich, 836 N. 9th St.
W. B. Yeager & Son, 150 S. 9th St.

WHY A TIN ROOF?

Fire Test

Slate and tile when subjected to intense heat crack and fall apart, exposing the wood sheathing and the interior of the building. Slag, rubber or asphalt roofing and similar built up or composition roofing all contain pitch, tar, or other bituminous compounds, that invite the fire deamon and are only a degree less dangerous than wood shingles.

Except that they are not placed there with malicious intent they have all the dire qualities of fagots piled about the victim to be burned at the stake.

Tin is NOT combustible.

A tin roof is an unbroken sheet of metal—no cracks or openings of any kind to admit fire.

It is a matter of common knowledge that fire has leaped across a building covered with tin and destroyed another building roofed with composition materials.

For the better grade of roofing, consult the following, who will give you expert advice free:

Teodor Andruszczak, 254 S. 9th St.
Wm. Bitting, 3 N. 2d St.
Frantz & Luppold, 1217 N. 11th St.
Thos. Gring, Hyde Park.
Wm. Hartman, 4th & Buttonwood.
N. E. Homan Est., 212 S. 9th St.
Jno. Haigh, 1036 Greenwich St.
Geo. S. Hiltebeitle, 523 Bingaman.
J. A. Kolb, 225 N. 9th St.
Walter Frutzman, 209 N. 3d St.
W. Irvin Renninger, 620 N. Front.
Reaser & Speice, 429 Court St.
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Paul Waldman, 1139 Church St.
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W. B. Yeager & Son, 150 S. 9th St.

WHY A TIN ROOF?

The Lightning Test

The safest place during a thunder storm is in a building roofed with tin. No need to worry. A roof entirely covered with tin has never been penetrated by lightning or set afire from this cause, so far as can be ascertained, nor has anyone been injured by lightning while under a tin roof.

This is scientifically explained as due to the capacity of such surface of sheet metal to scatter or diffuse electricity, thus rendering it harmless. Metal spoutings connect into the earth, further minimizing danger from lightning. No need of lightning rods here.

Farmers generally are recognizing the protection against lightning afforded by a tin roof. This cannot be said for any other style of roofing.

For the better grade of metal roofing consult the following, who will give you expert advice free:

Teodor Andruszczak, 254 S. 9th St.
Wm. Bitting, 3 N. 2d St.
Frantz & Luppold, 217 N. 11th St.
Thos. Gring, Hyde Park.
Wm. Hartman, 4th & Buttonwood.
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Paul Waldman, 1139 Church St.
Luther Yeich, 836 N. 9th St.
W. B. Yeager & Son, 150 S. 9th St.

WHY A TIN ROOF?

Water Proof Test

When tin plates or sheets are cleated together, soldered and laid as a roof, they form one piece of unbroken metal from edge to edge. Water cannot penetrate a sheet of roofing tin, nor a properly laid roof of such sheets.

Complete impenetrableness can be claimed for tin roofs alone. Composition roofs admit moisture through the exposed and semi-exposed nail holes. They cannot be absolutely waterproofed, nor remain so.

In tin or metal roofs there are no such exposed nails—no such spots of weakness. Only accidental injury can cause a leak in a metal roof, and in such event a leak is easily found and repaired.

Composition roofs are dirty and frequently clog the spoutings with tar and gravel.

For the better grade of metal roofing consult the following, who will give you expert advise free:

Teodor Andruszczak, 254 S. 9th St.
Wm. Bitting, 3 N. 2d St.
Frantz & Luppold, 217 N. 11th St.
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Wm. L. Whitcraft, 219 Walnut St.
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Paul Waldman, 1139 Church St.
Luther Yeich, 836 N. 9th St.
W. B. Yeager & Son, 150 S. 9th St.

Four of a Series of Advertisements on Tin Roofing, Published by Sheet Metal Contractors of Reading, Pennsylvania.

Secretary Seabrook's letter follows, and the advertisements mentioned in the foregoing are also reproduced herewith:

To Local Members:

As previously announced, a subject will be assigned each month together with data and materials, for discussion at the local meetings.

Our locals have talked about many things: Prices, material, collections, costs, trade protection, etc., but none of these within itself has opened the way for the sale of an additional pound of metal for an hour's work.

Would it not be wise for the membership to turn its thought and

activity toward increasing the use of sheet metal through some form of publicity? This is the object in asking you to discuss, in all its phases, "Collective Advertising" and kindred subjects for the following months.

If the use of sheet metal is slipping away, one of the reasons is the lack of knowledge as to its merits on the part of the public.

Very truly yours,
E. L. SEABROOK, Secretary.
Philadelphia, August 26, 1922.

Michigan Sheet Metal Men Use Blue Print for Invitation.

What is claimed by N. L. Pierson, Jr., Assistant District Manager at Detroit for the American Rolling Mill Company, to be the first and original blue print invitation has been received by AMERICAN ARTISAN.

It announces the Second Annual Armco Corn Roast given to the Detroit Sheet Metal Contractors, their ladies and friends at the country home of Mrs. Pierson, near Birmingham, Michigan, the date being Friday, September eighth.

A reproduction of the invitation is shown in the accompanying illustration.

P. S.—We note that the place of the roast is at "Pierson's Ranch," and, therefore, humbly apologize to "Newt" for calling it a country home.

Notes and Queries

Specification Pitch and Specification Felt.

From New Ulm Sheet Metal Works, 11 South Minnesota Street, New Ulm, Minnesota.

We would like to know who manufactures specification pitch and specification felt for built-up roofs.

Ans.—The American Tar Products Company, 208 South LaSalle Street, Chicago, Illinois.

Invitation to Second Annual Armco Corn Roast for Detroit Sheet Metal Men.

School of Automobile Radiator Repairing in Chicago.

From Sidney McDonald, 5534 Indiana Avenue, Chicago, Illinois.

Where, in Chicago, can I take a course in automobile radiator repairing?

Ans.—Greer College of Motoring, 2024 South Wabash Avenue, and Lewis Institute, 1949 West Madison Street; both of Chicago, Illinois.

Address of Conway Steel Range Company.

From Stove Dealers Supply Company, 310 Chestnut Street, Milwaukee, Wisconsin.

Will you kindly let us know where the Conway Steel Range Company is located.

Ans.—Bellevue, Ohio.

"Universal" Lawn Mower.

From Julius Rieth, Lansing, Iowa.

Please advise me who manufactures the "Universal" lawn mower, as I want to secure repairs for same.

Ans.—Clarinda Lawn Mower Company, Clarinda, Iowa, and Blair Manufacturing Company, Springfield, Massachusetts, both make a "Universal" lawn mower.

Stove.

From R. W. Tyler, 34 North 1st Avenue, Canton, Illinois.

Can you inform me who makes a stove that burns coal oil and that lights instantly like gas?

Ans.—Vapo Stove Company, Lima, Ohio; Detroit Vapor Stove Company, Detroit, Michigan, and American Gas Machine Company, Incorporated, Albert Lea, Minnesota.

Repairs for "Apex" Furnace.

From E. B. Werner, Hoopeston, Illinois.

Can you inform me who makes the "Apex" furnace, as I want to get repairs for it?

Ans.—It was made by the Youngstown Furnace Company, Youngstown, Ohio, and you can secure repairs for it from Carr Supply Company, 414 North Dearborn Street, and Northwestern Stove Repair Company, 654 West Roosevelt Road; both of Chicago, Illinois.

Address of Mott Wheel Works.

From P. T. Bradley, R. F. D. No. 2, Box 228, Portsmouth, Virginia.

Kindly give me the address of the Mott Wheel Works, makers of wire automobile wheels.

Ans.—Jackson, Michigan.

Review of Conditions in the Metal Markets.

General Situation in the Steel Industry. Report of Prices and Tendencies in Sheet Metals, Pig Iron, etc.

COPPER MARKET SHOWS SLIGHT IMPROVEMENT.

Some slight improvement is reported in the demand for electrolytic from domestic consumers, but buying is still moderate and confined largely to filling-in contracts for early shipment. There is some little interest shown in future positions also. Producers remain firm and little if any electrolytic is for sale under 14 cents delivered for nearby shipment, and most of the offerings by second hands for nearby delivery have been absorbed. As more copper will be available for future shipment, large consumers could buy electrolytic at 13⅞ cents to 14 cents delivered for shipment over the last quarter of the year. Few if any of the producers are offering copper for shipment after the end of 1922. Second hands are ready to entertain bids for shipment over the first quarter of next year.

The shortage of labor in the large copper mines of the west, which resumed operations on April first, following a year's suspension, is attributed to the strict immigration laws. In some sections the shortage is so serious as to hinder bringing production of the red metal to approach anything like normal.

Chicago warehouse price on sheet copper is up a half cent, the base quotation being 21¼ cents.

Tin.

In the tin market the prices are about ⅛ cent higher on prompts and ¼ cent higher on futures. Prompt Straits has been sold at 32⅜ cents and November-December deliveries at 32½ cents with further offerings at the same price. Banca is nominally 32¼ cents for any position and 99 per cent ranges from 32⅛ cents on prompts down to 31⅞ cents on October and November.

The deliveries in August are still being estimated at around 4,000 tons which will leave stocks of about 2,500 to 3,000 tons in New York on September first of which more than 2,000 tons are stored in warehouses. A confirmation of the dullness in the consuming demand is to be seen in the fact that store stocks have increased during July and August, dealers and importers having placed tin in store because they had nowhere else to put it.

Chicago warehouse prices have been advanced to 35⅞ cents for pig tin and 37⅞ for bar tin.

Lead.

There is no great activity except in the filling of past orders for lead which are at present straining the facilities of most of the producers to execute. New business is light in volume, but prices, being already conservatively restrained, are no lower, especially as outside lots in second hands are small.

The situation in general seems as sound as ever, notwithstanding the untoward conditions affecting all lines of trade.

Chicago warehouse prices remain at $6.05 for American pig, $6.80 for bar lead and $9.00 for sheet lead in full coils.

Zinc.

There is very little doing in the zinc market at the moment, and prices are nominally unchanged, there being no particular selling pressure indicated, though it is reported that 6.25 cents East St. Louis has been shaded a trifle for prompt shipment. Though spot stocks are light consumers seem to have profited by the warning they had as to this condition and are in most cases well covered for early requirements, so that with the interruption in full consumption, due to the fuel situation, the supplies though small are ample for the present.

The lull in demand generally must also be attributed mainly to the same conditions that are causing so much uncertainty as to the possible scale of operations for many weeks to come. There is apparently plenty of business to be done if these disturbing elements were out of the way.

As to future needs the situation is full of uncertainty for the consumer, but future costs are equally uncertain for the smelter, so that there is little disposition on either side to trade freely at present in forward deliveries.

Meanwhile the statistical position is sound enough to maintain a fairly steady one despite the present dullness.

Zinc sheets remain at 8¾ cents in cask lots, as quoted by Chicago warehouses. Zinc in slabs is $6.90.

Prices on Nuts and Rivets Are Higher.

Mill quotations for cold punched square or hexagon nuts have been advanced through a reduction of the discount from $4.50 to $4.00 off the lists. Other lines of nuts also have been advanced, and rivets have been marked up all along the line.

Sheets.

All the current influences are in the direction of forcing higher prices for sheets, beyond the present range of 3.35 cents to 3.50 cents for common black Pittsburgh. (1) A well authenticated transaction in sheet bars has occurred at $38, Pittsburgh basis, involving 2,000 tons and higher prices still seem to be coming. (2) High costs of coal, which mills might stand temporarily as merely representing one of the exigencies of business, are now made permanent, and have to be passed on to the consumer if possible. (3) The general level of wages in the iron and steel industry is advanced 20 per cent, effective September first, while tonnage

Comparative Statement of Prices on Tin, Copper, Lead and Zinc.

This Shows Prices Per Pound As Quoted by First Hand Dealers and Producers.

	Aug. 29.	Aug. 28.	July 31, A Month ago.	Aug. 29, A Year ago.
TIN—				
Straits	32.37½	32.25	32.62½	26.37½
99 per cent	32.12½	32.00	32.25	25.87½
Banca	32.25	32.00	32.37½	25.87½
COPPER—				
Prime Lake, delivered	14.00	14.00	14.12½	12.12½
Electrolytic, f. o. b., refinery	13.87½	13.87½	13.87½	11.60
Casting, f. o. b., refinery	13.37½	13.37½	13.45	11.37½
LEAD—				
New York	5.90	5.90	5.75	4.40
East St. Louis	5.57½	5.57½	5.47½	4.20
ZINC—Prime Western—				
New York	6.60	6.60	6.57½	4.65
East St. Louis	6.25	6.25	6.22½	4.15

wages, by the bi-monthly settlement, are certain also to go up, effective the same date. (4) Unsatisfied demand is heavy, as production has been restricted continuously for a long time, while there is no evidence that the circumstances that have hampered production have hampered consumption to a like extent.

Bearing on the general point that circumstances seem certain to force sheet prices to higher levels is the showing made by the American Sheet & Tin Plate Company. The leading interest, when advancing its basis from 3.15 cents to 3.35 cents, recently, apparently did not feel that it could risk opening its order books for fourth quarter to all comers, and, therefore, adopted the plan of having no formal opening, but of entering tonnages from regular customers. In normal times the company opens its order books and then seeks to make sales to those whose credit is good and who are likely to accept delivery.

Nearly all the independents are now up to the 3.50 cent basis, the leading interest being on a 3.35 cent basis, though it is not free to sell in the general market. The range of the market, disregarding small prompt lots, which may go at higher prices, is as follows: Blue annealed, 2.50 cents to 2.60 cents; black, 3.35 cents to 3.50 cents; galvanized, 4.35 cents to 4.50 cents; automobile sheets, 4.70 cents to 4.85 cents, all Pittsburgh basis.

Production of sheets still tends to decrease. The last figures of the National Sheet and Tin Plate Association showed production in July at 73 per cent of capacity, but the rate was higher at the beginning of the month and lower at the close, while it is lower still now, possibly under 60 per cent. The leading interest has been operating at slightly over 60 per cent, but in view of blast furnace and steel mill conditions the rate may easily go below 60 per cent.

The demand now expressed in actual orders and inquiries might not be considered heavy if all mills were in physical position to run full, but is quite heavy by comparison with the rate at which mills actually can operate, and developments to date, in connection with coal and transportation conditions, do not indicate that the operating rate will increase in the near future.

Chicago warehouses quote sheets at 25 cents higher than last week, 28 gauge black sheets being $4.85 and 28 gauge galvanized sheets, $5.85.

Prices on Pig Iron and Steel Products Keep on Going Up.

Settlement of Coal Strike Has No Influence on Situation, As Rail Situation Shows No Improvement.

The prices of finished steel continue to seek higher levels. While no definite price policy has been announced by the leading producer, it is believed that the 1.80 cents quotation on bars, shapes and plates has disappeared. This means that the minimum on these products for indefinite delivery lies somewhere between 1.80 cents and 2.00 cents, Pittsburgh. In the meantime the prices for specified delivery have advanced. Independents who are still in the market are quoting as high as 2.25 cents on shapes and bars and 2.50 cents or more on plates.

Pig iron prices again advanced all along the line. No. 2 foundry is quoted at $26 to $34, valley, but iron for prompt delivery is so scarce that in several instances hard pressed consumers have gone far beyond the confines of their normal market to fulfill their wants. Sales of foreign iron continue to be made in Boston, New York and Philadelphia, and it is estimated that during the present buying movement more than 200,000 tons of British iron has been ordered for American shipment. Quotations on furnace coke again have been revised downward, the spread being from $10 to $11 Connellsville ovens.

Chicago prices on pig iron are as follows: Northern Number 2 Foundry, $30.00; Southern Number 2 Foundry, $27.00; Lake Superior Charcoal, $36.15.

Current Hardware and Metal Prices.

AMERICAN ARTISAN AND HARDWARE RECORD is the only publication containing Western Hardware and Metal prices corrected weekly.

METALS

PIG IRON.

Chicago Foundry..	$30 00
Southern Fdy. No. 2	26 00 to 27 00
Lake Sup. Charcoal	36.15
Malleable.....	30 00

FIRST QUALITY BRIGHT TIN PLATES.

		Per Box
IC	14x20 112 sheets	$10 00
IX	14x20.....	11 25
IXX	14x20.....	12 60
IXXX	14x20.....	13 90
IXXXX	14x20.....	15 25
IC	20x28.....	20 00
IX	20x28.....	22 50
IXX	20x28.....	25 20
IXXX	20x28.....	27 80
IXXXX	20x28.....	30 50

COKE PLATES.

Cokes, 180 lbs...	20x28	$11 80
Cokes, 200 lbs...	20x28	12 00
Cokes, 214 lbs...IC	20x28	12 35
Cokes, 270 lbs...IX	20x28	14 10

BLUE ANNEALED SHEETS.

Base .....per 100 lbs. $3 75

ONE PASS COLD ROLLED BLACK.

No. 18-20.....per 100 lbs.	$4.65
No. 22-24.....per 100 lbs.	4.70
No. 26.....per 100 lbs.	4.75
No. 27.....per 100 lbs.	4.80
No. 28.....per 100 lbs.	4.85
No. 29.....per 100 lbs.	4.95

GALVANIZED.

No. 16.....per 100 lbs.	$5.10
No. 18-20.....per 100 lbs.	5.25
No. 22-24.....per 100 lbs.	5.40
No. 26.....per 100 lbs.	5.55
No. 27.....per 100 lbs.	5.70
No. 28.....per 100 lbs.	5.85
No. 30.....per 100 lbs.	6.35

BAR SOLDER.

Warranted.

50-50 .....per 100 lbs. $22 25

Commercial.

45-55 .....per 100 lbs.	20 75
Plumbers .....per 100 lbs.	19 50

ZINC.

In Slabs 6.90

SHEET ZINC.

Cask lots, stock.....	8¾c
Less than cask lots.....	9¼c

COPPER.

Copper Sheets, base.....21¼c

LEAD.

American Pig	6 05
Bar	6 80

Sheet.

Full coils ....per 100 lbs.	9 00
Cut coils ....per 100 lbs.	9 25

TIN.

Pig Tin .....per lb.	35⅞c
Bar Tin	37⅞c

HARDWARE, SHEET METAL SUPPLIES, WARM AIR HEATER FITTINGS AND ACCESSORIES.

ADZES.

Coopers'.

Barton's	Net
White's	Net

AMMUNITION.

Shells, Loaded, Peters.

Loaded with Black Powder 18%
Loaded with Smokeless Powder 18%

Winchester.

Smokeless Repeater Grade .....20 & 4%
Smokeless Leader Grade .....20 & 4%
Black Powder .....20 & 4%

U. M. C.

Nitro Club .....20 & 4%
Arrow .....20 & 4%
New Club .....20 & 4%

Gun Wads—per 1000.

Winchester 7- 8 gauge 10&7½%
" 9-10 gauge 10&7½%
" 11-28 gauge 10&7½%

ASBESTOS.

Paper up to 1/16.....6c per lb.
Rollboard .....6¼c per lb.
Millboard 3/32 to ⅛....6c per lb.
Corrugated Paper (250 sq. ft. to roll).....$6.00 per roll

AUGERS

Boring Machine.....40&10%
Carpenter's Nut 50%

Hollow.

Bonney's.....per doz. $30 00

Post Hole.

Iwan's Post Hole and Well .....30 and 5%
Vaughan's, 4 to 9 in., without handles per doz. $14 00

AWLS.

Brad.

No. 3 Handled..per doz.	$0	65
No. 1050 Handled "	1	40
Patent asst'd, 1 to 4 "		35

Harness.

Common .....per doz.	$1	05
Patent ..... "	1	00

Peg.

Shouldered ..... "	1	60
Patented ..... "		75

Scratch.

No. IS, Socket Handled .....per doz. $2 50
No. 344 Goodell-Pratt, list less.....35-40%
No. 7 Stanley....per doz. $2 25

AXES.

First Quality, Single Bitted (unhandled), 3 to 4 lb., per doz.....$10 50

Good Quality, Single Bitted, same weight, per doz. 9 50

BALANCES, SPRING.

Universal.

Sight Spring.....List less 25%
Straight .....List less 25%

BARS, WRECKING.

V. & B. No. 12.....	$0 34
V. & B. No. 24.....	0 43
V. & B. No. 324.....	0 57
V. & B. No. 30.....	0 48
V. & B. No. 330.....	0 63

BEVEL, TEE.

Stanley's Rosewood handle, new list .....Nets
Stanley iron handle.....Nets

BINDING CLOTH.

Zinc 55%
Brass 40%
Brass, plated 60%

BITS.

Auger.

Jennings Pattern.....Net
Ford Car.....25% off
Ford's Ship.....25% off
Irwin 35%
Russell Jennings.....less 10%
Clark's Expansive.....33⅓%

Center 10%

Countersink.

American	Shellhead.....	1 75
"	Rose	2 00
"	Flat	1 40

Dowel.

Russel Jennings .....plus 20%

Gimlet.

Standard Double Cut Gross $8 40
Nail Metal Single Cut .....Gross $4 00—$5 00

Reamer.

Standard Square....Doz. $2 50
American Octagon.. " 2 50

Screw Driver.

No. 1 Comomn.....Each 18c
No. 26 Stanley.....Each 70c

BLADES, SAW.

Wood.

Atkins 30-in.

Nos.	6	40	26
	$3 90	$9 45	$5 40

Diston 30-in.

Nos.	6	66	26
	$9 45	$10 05	$9 45

BLOCKS.

Wooden 20%
Patent 20%

BLOW TORCHES (See Firepots).

BOARDS.

Stove.		Per. Doz.
26x26,	wood lined.....	$14 45
28x28,	" "	16 95
30x30,	" "	19 00
26x26,	paper lined.....	8 15
28x28,	" "	9 10
30x30,	" "	10 20

Wash.

No. 760, Banner Globe (single) .....per doz. $5 25
No. 652, Banner Globe (single) .....per doz. 675
No. 801, Brass King, per doz. 3 25
No. 860, Single—Plain Pump 6 25

BOLTS.

Carriage, Machine, etc.

Carriage, cut thread, ⅜x6 and sizes smaller and shorter 60%
Carriage sizes, larger and longer than ⅜x6....50 & 5%
Machine, ⅜x4 and sizes smaller and shorter.....60 & 10%
Machine, sizes larger and longer than ⅜x4..50-10 & 5%
Stove 75%

Mortise, Door.

Gem, iron 5%
Gem, bronze plated.....5%

Barrel.

Cast .....Net
Wrought ..... "
Wrought, bronzed ..... "

Flush.

Wrought .....Net

Spring.

Wrought ..... "
Wrought, heavy ..... "

Square.

Wrought ..... "

BOXES.

Mail. No..	2	4	10
Per doz..	$18 00	$23 00	$29 00

Cast Iron.

Per doz. $9 50

Mitre.

Stanley's..... Net Prices
Stearns, No. 2..per doz. $48 00

BRACES, RATCHET.

Goodell-Pratt	No. 408.....	$4 60
" "	No. 410.....	4 80
" "	No. 412.....	5 00
V. & B. No. 444 8 in.....		4 65
V. & B. No. 333 8 in.....		4 30
V. & B. No. 222 8 in.....		4 00
V. & B. No. 111 8 in.....		3 50
V. & B. No. 11 8 in.....		3 05

BURRS, RIVETING.

Copper Burrs only.....50%
Tinners' Iron Burrs only....Net

BUTTS.

Steel, antique copper or dull brass finish—case lots—
3½x3½...per dozen pairs $2 75
4x4..... " " " 3 80
Heavy Bevel steel inside sets, case lots—
.....per dozen sets 7 50
Steel bit keyed front door sets, each 1 80
Wrought brass bit keyed front door sets, each.... 3 25
Cylinder front door sets, each 7 00

CALIPERS.

Double .....Net
Inside and Outside ..... "
Wing ..... "

CARRIERS.

Hay.

Diamond, Regular...each, nets
Diamond, Sling..... " "

CASTERS.

Standard—Ball Bearing. ..... 50 & 10%
Bed 40%

Common Plate.

Brass Wheel 15%
Iron and porcelain wheels, new list 50%
Philadelphia Plate, new list 50%
Martin's 40%

CATCHERS, GRASS.

No. 160S.....per doz. $12 25
No. 165S..... " 14 02

CEMENT, FURNACE.

American Seal,	5 lb. cans, net	$0 45
"	10 lb. cans, "	90
"	25 lb. cans, "	1 87
Asbestos,	5 lb. cans..... "	45
Pecora,	5 lb. cans..... "	45
"	10 lb. cans..... "	90
"	25 lb. cans..... "	1 87

CHAINS.

Breast Chains.

With Slide....doz. pairs, $5 50
Without Slide.. " 5 06
Doublestack .... " 9 35
With Covert Snaps " 6 33

Picture Chains.

Light brass, 3 ft., per doz. 1 25
Heavy brass, 3 ft. " 1 75

Sash Chain. (Morton's)

Steel, per 100 ft.

0	$2 50
2	3 10
1	3 60

Champion Metal.

0R	5 40
2R	5 60
1R	7 75

Champion Metal.—Extra Heavy.

1H $9 50

Cable Sash Chains.

Steel.....List Net Plus 15%

CHALK, CARPENTERS'.

Blue .....per gro.	$2	00
Red ..... "	2	00
White ..... "	1	80
Common White School Crayon ..... "	0	30

CHIMNEY TOPS.

In bags.....per bag $1 80

CHECK, DOOR.

Corbin .....Net list
Russwin .....Net list

CHISELS.

Cold.

V. & B. No. 25, ¼ in., each $0 26
V. & B. No. 25, ⅝ in., each 41

Diamond Point.

V. & B. No. 15, ¼ in..... 0 31
V. & B. No. 15, ½ in..... 0 48

Firmer Bevelled.

Round Nose.

V. & B. No. 65, ¼ in..... 0 31
V. & B. No. 65, ½ in..... 0 40

Socket Firmer.

Cape.

V. & B. No. 50, ⅜ in..... 0 31
V. & B. No. 50, ¾ in..... 0 57

CHUCKS, DRILL.

Goodell's, for Goodell's Screw Drivers.....List less 35-40%
Yankee, for Yankee Screw Drivers $6 00

CHURNS.

Anti-Bent Wood.

Gal.	5	7	10
Each	$3 00	$4 60	4 85

Belle, Barrell.....65 & 7½%

Common Dash.

Gal.	5	7
Per doz.....	$17 00	19 00

CLAMPS.

Adjustable.

Martin's 30%
No. 63, Screw.....20%

Cabinet.

Screw 20%

Carpenters'.

Steel Bar..List price plus 20%

Carriage Makers'.

2½-inch.....per doz	$	7 00
5 - "	"	14 00
8 - "	"	28 00
12 - "	"	42 00

Hose.

Sherman's brass, ¾-inch per doz. $0 48
Double, brass, ¾-inch, per doz. 1 20

Saw Filers.

Wentworth's, No. 1, $12.50; No. 2, $18.25; No. 3, $16.25.

CLAWS, TACK.

Wood hdl. No. 10..per doz.	$1	15
Forged steel, wood hdl. "	2	15
Solid steel ..... "	3	25
Giant ..... "		50